IEI Technology Corp.

MODEL:

IOWA-8522

Half-Size Intel® Pentium M or Celeron M ISA SBC, SATA RAID, 128 MB Onboard DDR Memory, LVDS LCD, VGA, LAN, Six USB Ports and CompactFlash® Slot

User Manual

Rev. 1.00 DECEMBER 2007

RoHS Lead Free

Revision

Date	Revision	Changes
November 2007	1.00	Initial Release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IOWA-8522 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IOWA-8522. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IOWA-8522. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the IOWA-8522. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IOWA-8522 motherboard from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the IOWA-8522 motherboard package.

- 1 x IOWA-8522 Single Board Computer
- 1 x Mini Jumper Pack
- 1 x IDE Cable
- 2 x SATA Cable
- 1 x SATA Power Cable
- 1 x Dual RS-232 Cable
- 1 x Keyboard/Mouse Y-cable
- 1 x USB Cable
- 1 x Utility CD
- 1 x QIG (Quick Installation Guide)

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Introduction

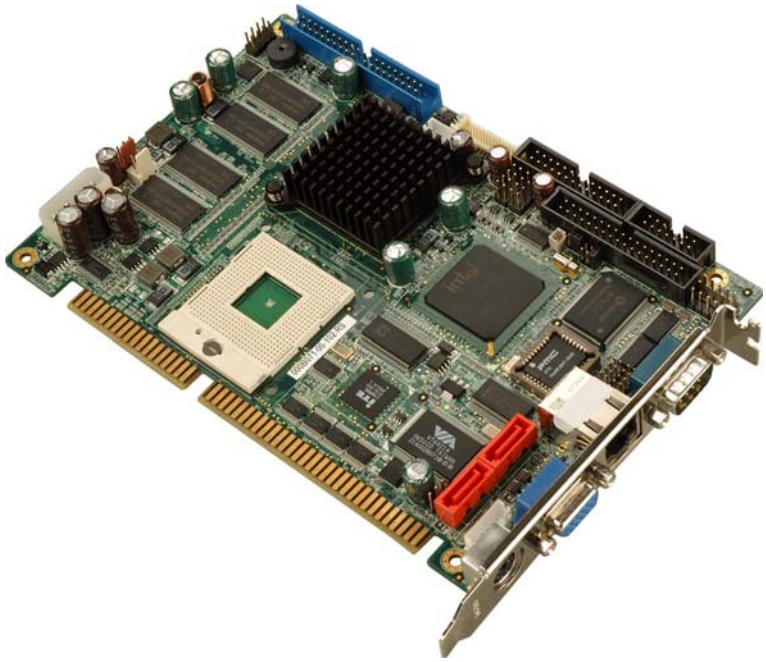

Figure 1-1: IOWA-8522

The IOWA-8522 is a half-size ISA CPU card with an embedded Intel® Celeron CPU or a socket 479 interface supporting Intel® Pentium® M and Intel® Celeron M processors. The IOWA-8522 features an Intel® 852GM Northbridge and Intel® I/O Controller Hub 4 (ICH4) Southbridge. The IOWA-8522 has a maximum front side bus (FSB) frequency of 400MHz, comes with 128 MB of DDR RAM onboard, supports up to 1 GB of 266MHz DDR RAM, comes with VGA and LVDS video support, and Ethernet support. The IOWA-8522 supports up to two SATA hard drives, two IDE devices, a CompactFlash® card and four USB 2.0 devices. The VIA® VT6421A enabled SATA drives support RAID 0 for performance, RAID 1 for data protection, and JBOD. Onboard audio is enabled via an AC'97 audio chipset.

1.2 Benefits

Some of the IOWA-8522 benefits are listed below.

- High-speed graphics card options with an AGP expansion slot
- Expansion capabilities enabled by five PCI slots

- Backwards compatibility through two legacy ISA slots
- Enhanced data security with SATA RAID 1 or increased speed with SATA RAID 0
- Multiple storage options with CompactFlash®, IDE and SATA interfaces
- Enhanced network speeds enabled by the Gigabit Ethernet chipset

1.3 Features

Some of the IOWA-8522 features are listed below.

- RoHS compliant
- Support for the following CPUs:
  - Intel® Celeron M 600MHz with 512K of L2 cache (embedded)
  - Intel® Celeron M 1GHz with no cache (embedded)
  - Socket 479 CPU socket for Celeron M and Pentium M
- Maximum FSB of 400MHz
- 128 MB of DDR RAM onboard
- One 200-pin 266MHz DDR SDRAM SO-DIMM supports up to 1 GB of memory
- High performance 10/100BASE-T Ethernet (PCIe Gigabit Ethernet on Socket 479 model)
- Two SATA ports with transfer rates of 1.5Gb/s
- RAID 0, RAID 1 and JBOD
- One IDE channel supporting up to two IDE devices
- One CompactFlash® Type I/II card slot
- Four USB 2.0 ports
- Integrated 5.1 channel audio

1.4 Overview

The IOWA-8522 has a wide variety of internal and external peripheral connectors. The peripheral connectors are connected to devices including storage devices, display devices and parallel communications devices. A labeled photo of the peripheral connectors is shown in **Figure 1-1**.

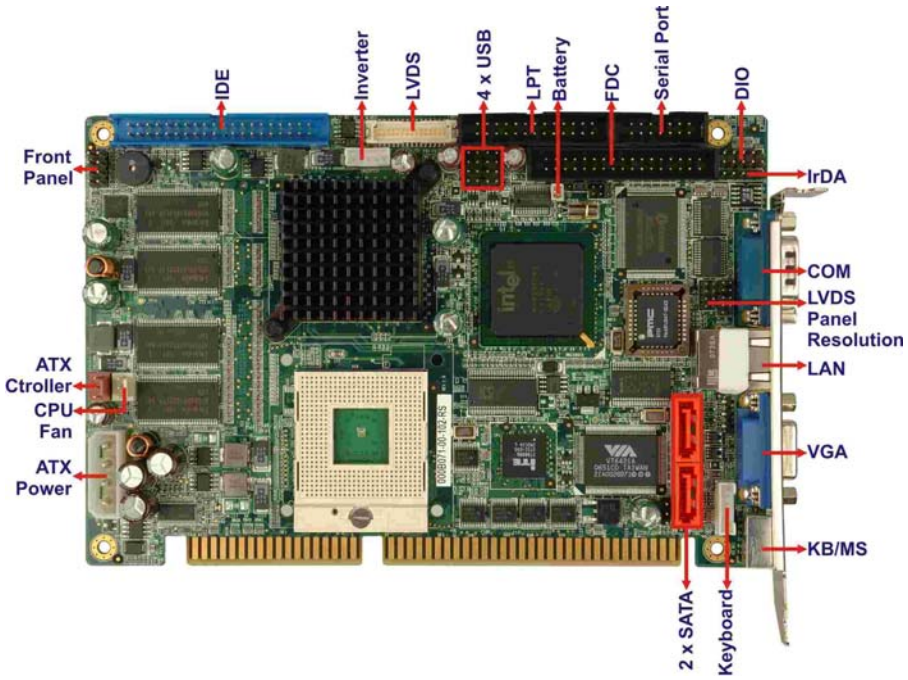

Figure 1-2: IOWA-8522 Main View

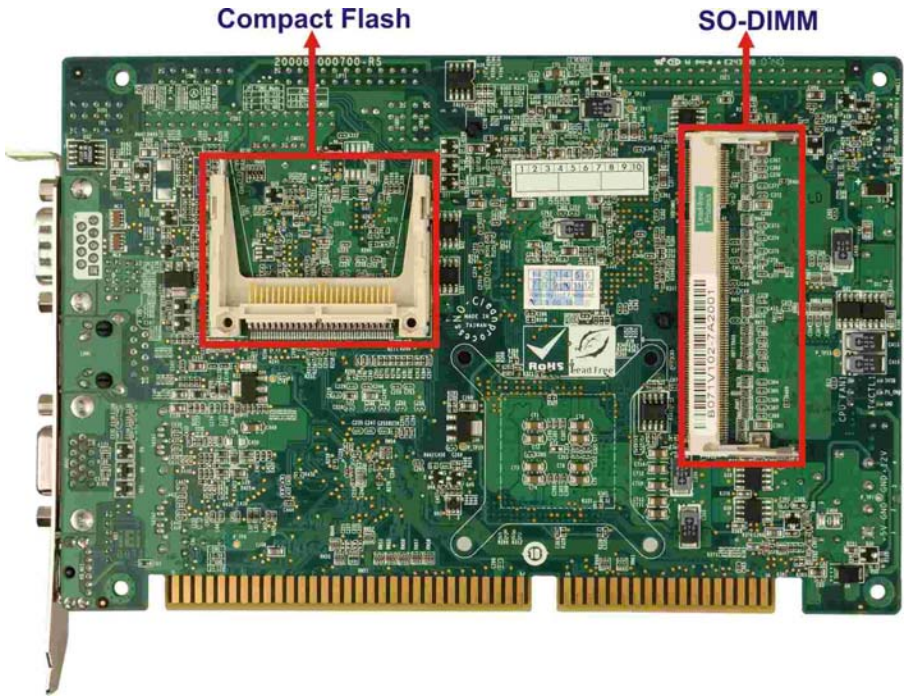

Figure 1-3: IOWA-8522 Solder Side

1.5 Peripheral Connectors and Jumpers

The IOWA-8522 has the following connectors on-board:

- 1 x Power connector
- 1 x ATX power control connector
- 1 x Audio connector
- 1 x Backlight inverter connector
- 1 x CompactFlash® slot
- 1 x CPU fan connector
- 1 x DDR SO-DIMM memory socket
- 1 x Digital input/output connector
- 1 x Floppy disk drive connector
- 1 x Front panel connector
- 1 x IDE connector
- 1 x Infrared connector
- 1 x Keyboard connector
- 1 x LVDS connector
- 1 x Parallel port connector
- 1 x Serial port connector
- 2 x USB connectors
- 2 x SATA connectors

The IOWA-8522 has the following connectors on the rear panel:

- 1 x Ethernet connector
- 1 x PS/2 keyboard/mouse connector
- 1 x Serial port connector
- 1 x VGA connector

The IOWA-8522 has the following on-board jumpers:

- Clear CMOS
- COM2 RS232/422/485 selection
- LVDS voltage selection
- LVDS screen resolution selection

1.6 Technical Specifications

IOWA-8522 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in Chapter 2.

Specification	IOWA-8522
Form Factor	Half-size CPU card
System CPU	Embedded CPUs: Intel® Celeron M 600MHz (Banias Core) Intel® Celeron M 1GHz (Dothan Core) Socket 479 CPUs: Intel® Pentium M Intel® Celeron M
Front Side Bus	400MHz
System Chipset	Northbridge: Intel® 852GM Southbridge: Intel® ICH4
Memory	128 MB of DDR RAM onboard One SO-DIMM socket supporting one 200-pin 266MHz DDR SO-DIMM up to 1 GB
Display	VGA Dual-channel 18-bit LVDS
BIOS	AMI BIOS
Audio	AC'97 audio
LAN	Intel® EP82562ET
COM	One RS-232 serial port One RS-232/422/485 serial port
USB 2.0	Four USB 2.0 devices supported

Specification	IOWA-8522
IDE	One 40-pin IDE connects to up to two Ultra ATA33/66/100 devices
SATA	Two 1.5Gb/s SATA drives supported
Keyboard/mouse	One PS/2 port supports mouse and keyboard connectivity One internal keyboard connector
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Consumption	5 V @ 5.29 A, 12V @ 0.13 A (Intel® Pentium M 2.0 GHz with 1 GB DDR)
Temperature	0ºC ~ 60ºC (32ºF ~140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions	185mm x 122mm
Weight (GW)	1.0kg

Table 1-1: Technical Specifications

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Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the IOWA-8522 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed and shown below.

- **Length**: 185 mm
- **Width**: 122 mm

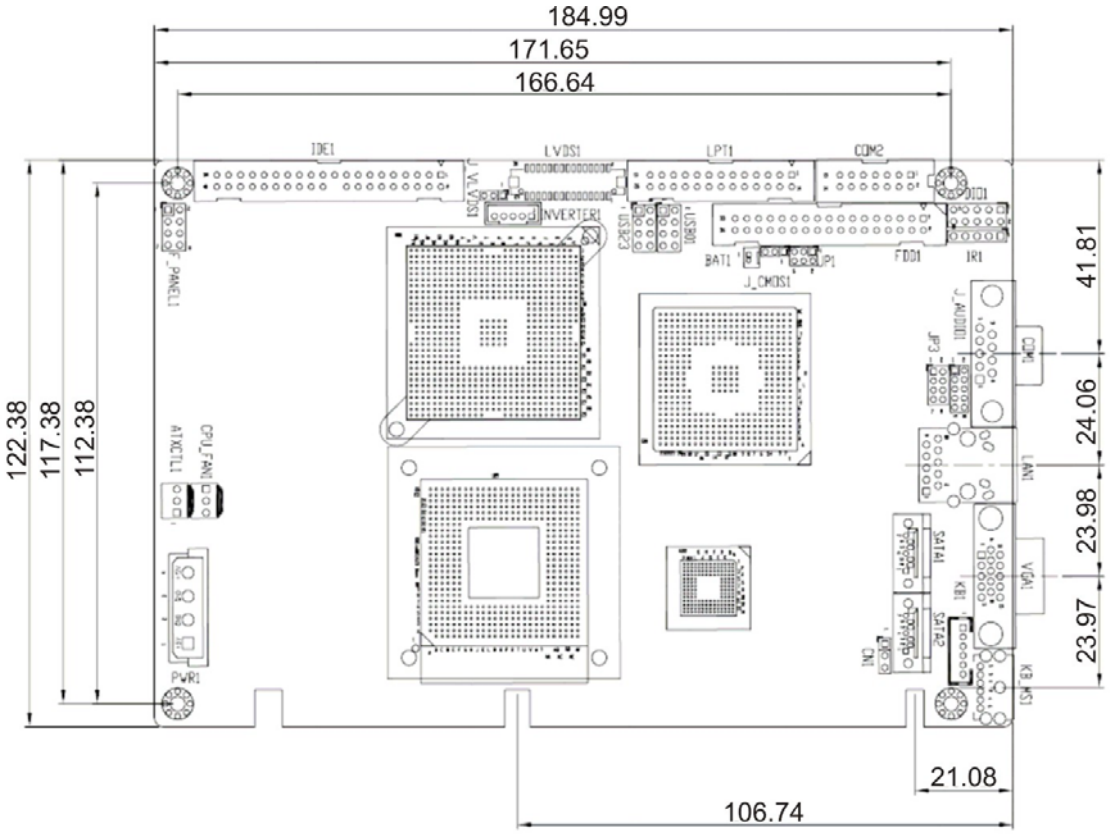


Figure 2-1: Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

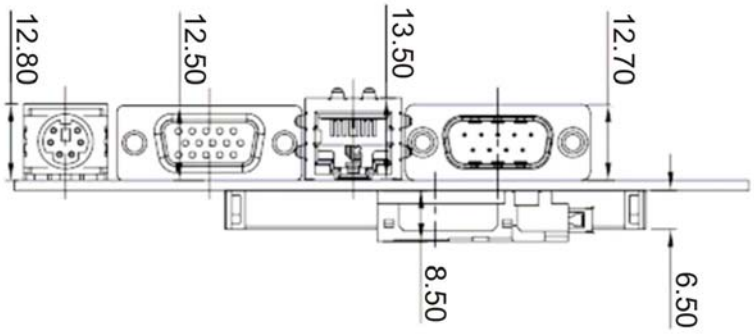


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

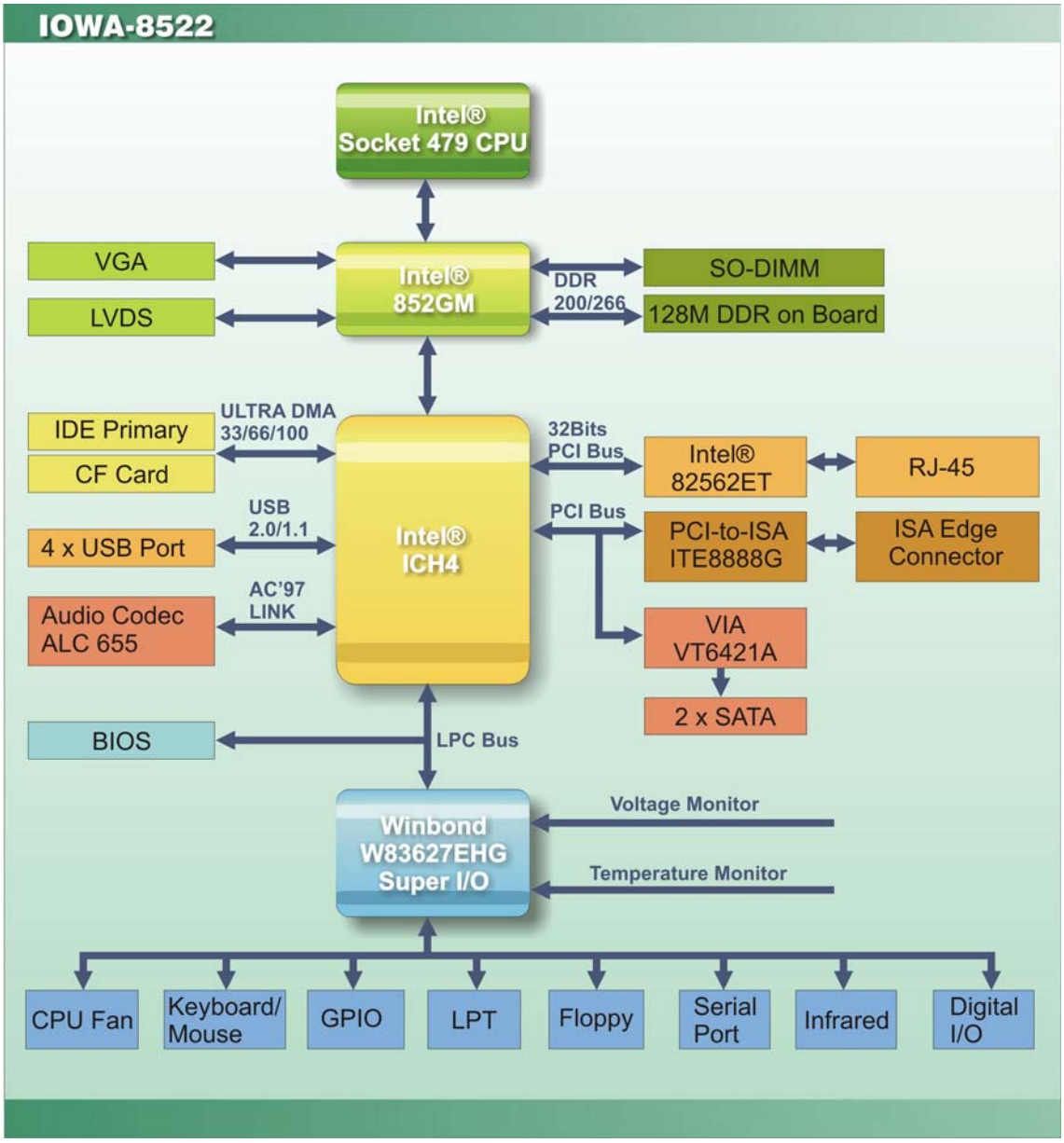


Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

Figure 2-4: CPU

The IOWA-8522 comes preinstalled with an Intel® Celeron M 600MHz (Banias Core), an Intel® Celeron M 1GHz (Dothan Core) or a Socket 479 CPU socket for Intel® Pentium M and Celeron M processors.

2.5 Intel® 852GM Graphics Memory Controller Hub

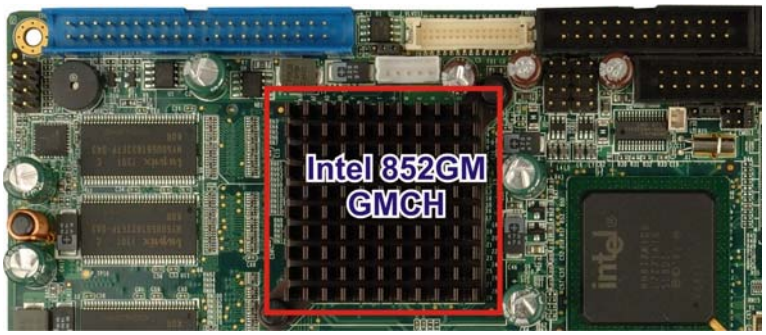


Figure 2-5: Intel® 852GM

The Intel® 852GM chipset comes with the following features:

- Supports Intel® NetBurst® micro-architecture
- 400 MHz system bus delivers a high-bandwidth connection between the processor and the platform
- Supports integrated graphics utilizing Intel® Extreme Graphics 2 technology

2.5.1 Intel® 852GM Memory Support

The Intel® 852GM comes with 128 MB of DDR RAM onboard. The onboard memory is shown in Figure 2-6:

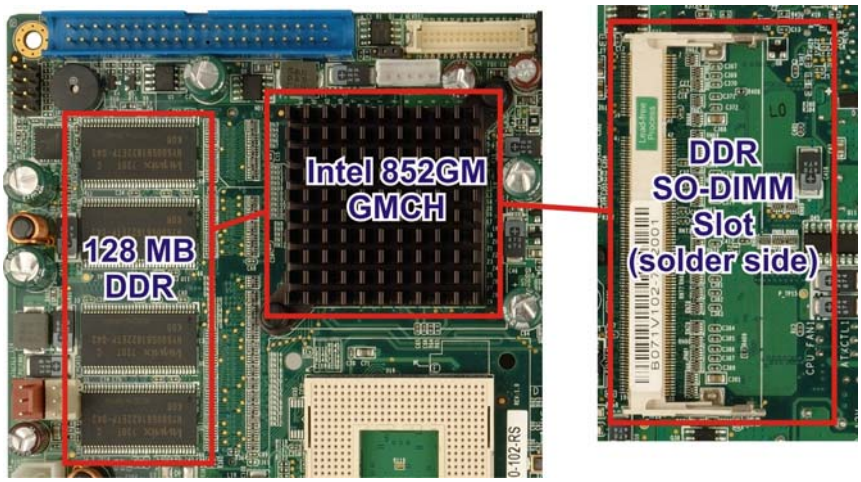


Figure 2-6: Onboard DDR RAM

The Intel® 852GM also supports one 200-pin DDR SO-DIMM with the following features:

- One 200-pin SO-DIMM
- DDR memory
- Single-channel
- Capacities of 256MB, 512MB, 1GB
- Transfer speeds of 200MHz or 266MHz

2.5.2 Intel® 852GM Display and Graphics Support

The Intel® 852GM Northbridge chipset has an integrated graphics engine that supports the following display devices:

- Analog CRT displays
- 18-bit dual channel LVDS

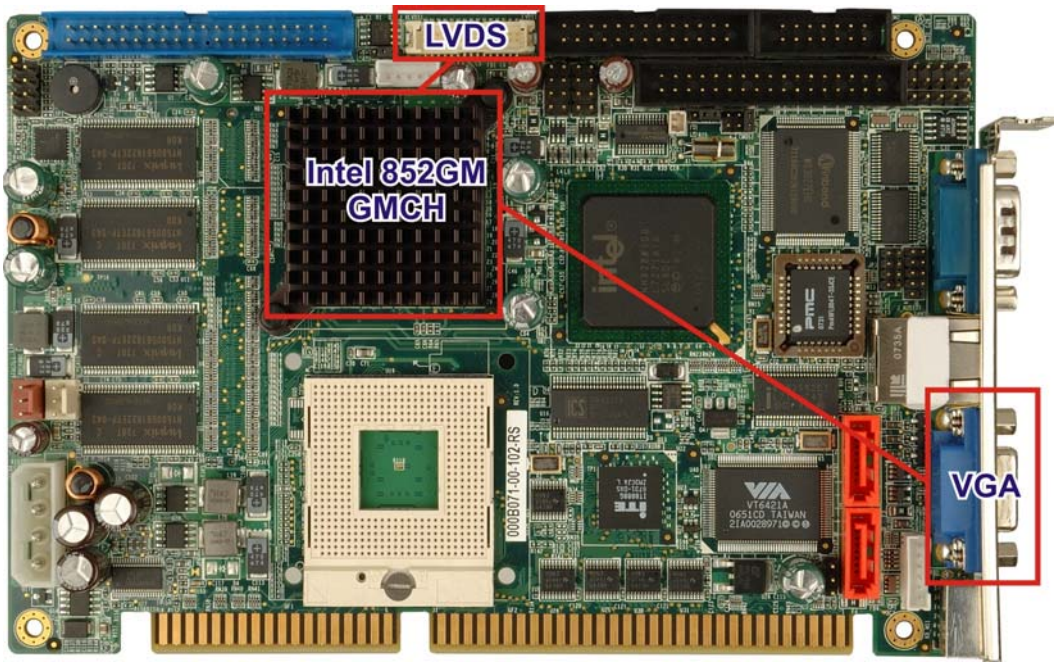


Figure 2-7: Display and Graphics Support

2.5.2.1 Analog CRT

The onboard Intel® 852GM GMCH has an integrated 350 MHz 24-bit RAMDAC that can directly drive a progressive scan analog monitor pixel with the following specifications:

- **Resolution**: 1600x1200 pixels with 85 Hz refresh rate
- **Resolution:** 1920x1440 pixels with 60 Hz refresh rate

2.5.2.2 LVDS Display Support

The onboard Intel® 852GM GMCH has an integrated dual channel LFP Transmitter interface to support LVDS LCD panel resolutions up to SXGA+ (1400x1050 @ 60 Hz) with maximum pixel depth of 18-bpp and with center and down spread SSC support of

0.5%, 1%, and 2.5% utilizing an external SSC clock. The display pipe provides panel up-scaling to fit a source image into a specific panel size as well as panning and centering support. The LVDS port is only supported on Pipe B. The LVDS port can only be driven on Pipe B, either independently or simultaneously with the DAC port.

2.5.2.3 Intel® 852GM Internal Graphics Controller

The Intel® Extreme Graphics 2 is integrated on the Intel® 852GM Northbridge chipset. The Intel® Extreme Graphics 2 features are listed below.

- **Enhanced Rapid Pixel and Texel Rendering**: Optimized visual quality and performance from the addition of hardware to support of texel formatting, bicubic filter, color blending accuracy, and video mixing render, resulting in optimized visual quality and performance.
- **Zone Rendering 2 Technology**: Enhances the performance of zone rendering by using larger zones and new commands that improve graphics pipeline efficiency.
- **Dynamic Video Memory Technology v2.0**: Increases total system performance by optimizing the efficiency of AGP dynamic video memory by increasing its size of Video RAM allocation to 96 MB.
- **Enhanced Intelligent Memory Management**: Improves memory bandwidth efficiency and platform performance by improving the memory management arbitration between CPU, system memory and graphics memory.

Intel® Extreme Graphics 2 specifications are listed below:

- Enhanced 2D:
  - 256-bit internal path
  - 8/16/32bpp
  - DirectDraw*, GDI, GDI+
  - Anti-aliased text support
  - Alpha blending
  - Alphas stretch blitter
  - Hardware alpha blended RGB cursor
  - Color space conversion
  - 5x2 overlay support

- Rotate, scale and translate operations

- High-performance 3D:
  - 256-bit internal path
  - 32bpp/ 24ZorW/ 8 Stencil
  - DX7*/DX8*/OGL*1.1
  - DXTn texture compression
  - Up to 4 textures / pixel on a single pass
  - Cubic reflection map
  - Embossed/DOT3 bump mapping
  - Multi-texture
  - DOT3 bump-mapping
  - Point sprites
- Video and Display:
  - DirectShow*/DirectVA*
  - Hardware motion compensation support for DVD playback
  - 4x2 overlay filter
  - 350 MHz DAC frequency
  - Maximum DVO pixel rate of up to 330MP/s
  - Flat panel monitors and TV-out support via AGP Digital Display (ADD) cards
  - 350 MHz DAC for 1800x1440 @ 85Hz max CRT resolution or 2048x1536@60Hz max FP resolution
  - Synchronous display for dual monitor capabilities
  - 350MHz RAMDAC for up to QXGA analog monitor support
  - Dual DVO ports for up to QXGA digital display support
- LVDS and CRT displays supported

2.6 Intel® 82801DB I/O Controller Hub (ICH4)

Figure 2-8: Intel® ICH4

The Intel® ICH4 I/O controller hub comes with the following features:

- PCI Local Bus Specification, Revision 2.2-compliant with support for 33 MHz PCI operations.
- ACPI Power Management Logic Support
- Enhanced DMA controller, Interrupt controller, and timer functions
- Integrated IDE controller supports Ultra ATA100/66/33
- USB host interface with support for six USB ports; 3 UHCI host controllers; 1 EHCI high-speed (only four USB ports implemented)
- USB 2.0 Host controller
- Integrated LAN controller
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
- Supports Audio Codec ’97, Revision 2.3 specification
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Alert On LAN* (AOL) and Alert On LAN 2* (AOL2)

2.6.1 IDE Interface

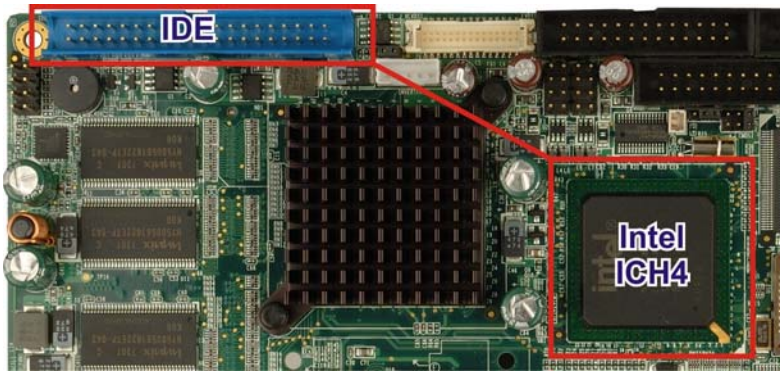


Figure 2-9: IDE Interface

The Intel® ICH4 supports four IDE hard disks and ATAPI devices. PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The onboard ATA-6 controller is able to support the following IDE HDDs. Two IDE devices can be connected to the primary IDE channel through the IDE header on the IOWA-8522. The CompactFlash® slot on the solder side of the IOWA-8522 is implemented through the secondary IDE channel.

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 5	UDMA 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-1: Supported HDD Specifications

2.6.2 AC'97 Controller

The IOWA-8522 has an AC'97 controller interface. The interface can be connected to an optional audio kit. The optional audio kit provides audio output through its onboard Realtek ALC655 audio codec **Figure 2-10**.

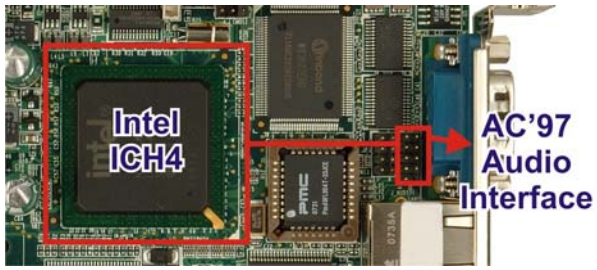


Figure 2-10:Realtek ALC655 Codec

Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal

- 12.288MHz BITCLK input
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.6.3 USB Controller

The Intel® ICH4 supports six USB ports. Four USB ports are implemented through pin headers on the IOWA-8522.

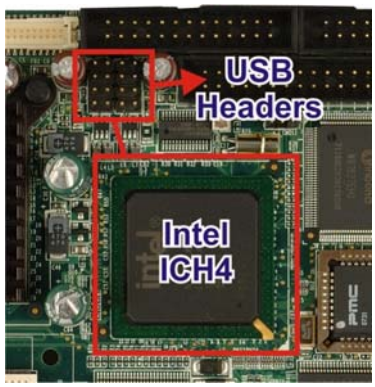


Figure 2-11: USB

The chipset USB controller has the following specifications:

- Six USB ports (four implemented)
- USB 1.1 and USB 2.0 compliant
- Three Universal Host Controller Interface (UHCI) controllers
- High-speed, full-speed and low-speed capable

2.6.4 PCI Interface

The PCI interface on the ICH4 is compliant with the PCI Revision 2.2 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.2 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to six PCI bus masters

2.6.5 LPC Interface

The ICH4 Low Pin Count (LPC) interface complies with the LPC 1.0 specifications. The LPC bus from the ICH4 is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.7 LPC Bus Components

The LPC bus is connected to components listed below:

- BIOS chipset
- Winbond W83627EHG Super I/O chipset

2.7.1 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset.

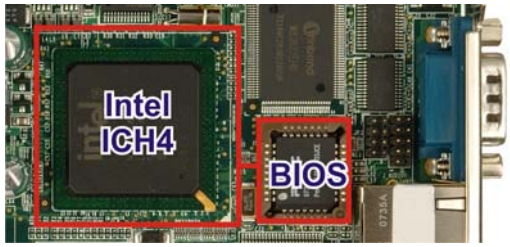


Figure 2-12: BIOS Chipset

Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.7.2 Super I/O chipset

The Winbond W83627EHG Super I/O chipset is connected to the ICH4 Southbridge through the LPC bus.

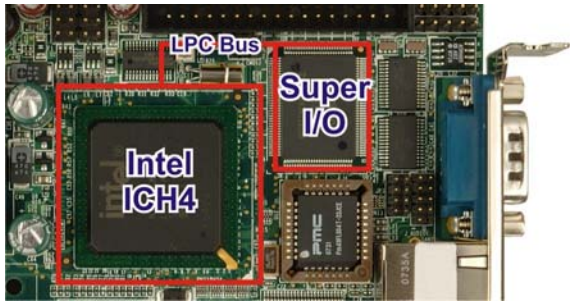


Figure 2-13: Super I/O Chipset

The Winbond W83627EHG is an LPC interface-based Super I/O device that comes with Environment Controller integration, floppy disk controller, UART controller and IR controller. Some of the features of the Winbond W83627EHG chipset are listed below:

- LPC Spec. 1.01 compliant
- LDRQ# (LPC DMA) and SERIRQ (serial IRQ) supported
- Hardware monitor functions integrated
- Microsoft PC98/PC99 Hardware Design Guide compliant
- ACPI DPM (Device Power Management) supported

Some of the Super I/O features are described in more detail below:

2.7.2.1 LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.01. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.7.2.2 Infrared

The onboard Super I/O supports the following infrared specifications:

- IrDA version 1.0 SIR protocol with a maximum baud rate up to 115.2Kbps

The IR controller on the super I/O is interfaced through the IrDA pin-header

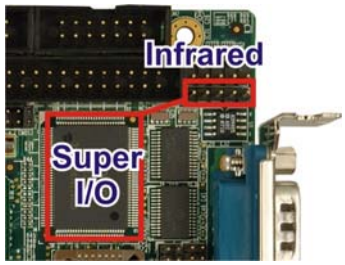


Figure 2-14: Infrared

2.7.2.3 Hardware Monitor Functions

The Super I/O Hardware Monitor monitors internal voltages, system temperature and the cooling fan speed. All the monitored environmental parameters can be read from the BIOS Hardware Health Configuration menu.

2.7.2.4 Parallel Port

The Super I/O parallel port (LPT) is compatible with the following LPT specifications.

- IBM parallel port compatible
- PS/2 compatible bi-directional parallel port
- Enhanced Parallel Port (EPP) mode supported. Compatible with IEEE 1284 specifications
- Extended Parallel Port (EPP) mode supported. Compatible with IEEE 1284 specifications
- Enhanced printer port back-drive current protection

The parallel port controller is connected to an external DB-26 LPT connector.

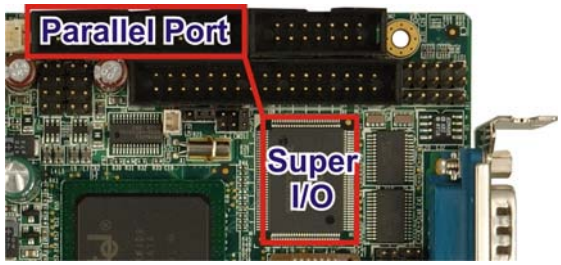


Figure 2-15: Parallel Port

2.7.2.5 Keyboard and Mouse Controller

The Super I/O keyboard and mouse controller is compatible with the following specifications.

- 8042 compatible
- Asynchronous access to two data registers and one status register
- Compatible with 8042 software
- PS/2 mouse supported
- Port 92 supported
- Interrupt and polling modes supported
- Fast Gate A20 and Hardware Keyboard Reset
- 8-bit timer/counter

The keyboard and mouse controller is interfaced to a keyboard and mouse connected to the backplane through the board-to-board connectors.

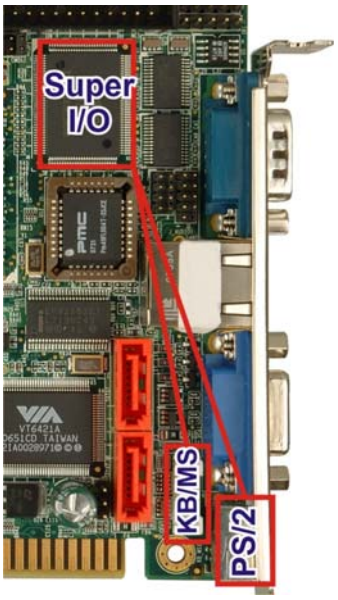


Figure 2-16: Keyboard and Mouse

2.7.2.6 Digital I/O Ports

The Super I/O has a 10-pin, 8-bit programmable digital input/output port.

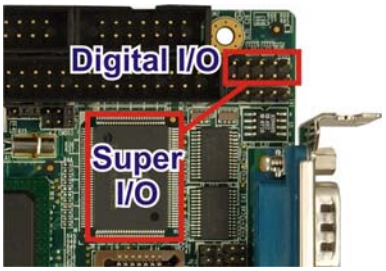


Figure 2-17: Intel® 852GM

2.7.2.7 Serial Ports

The on-board Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports
- IrDA 1.0 and ASKIR protocols
- SPP, BPP, EPP and ECP compatible parallel port

- 48 programmable general purpose I/O ports

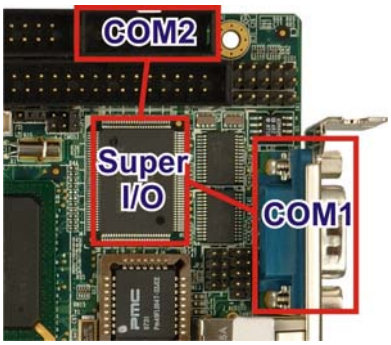


Figure 2-18: Super I/O Serial Ports

2.7.2.8 Floppy Disk Drive

The Super I/O FDD controller is compatible with the following specifications.

- IBM PC AT disk drive compatible
- Variable write pre-compensation with track selectable capability
- Vertical recording format supported
- DMA logic enabled
- 16-byte data FIFOs
- Overrun and under run conditions detected
- Built-in address mark detection circuitry to simplify the read electronics
- FDD anti-virus functions with software write protect and FDD write enable signal
- Supports 3.5-inch or 5.25-inch FDD
- Compatible with industry standard 82077
- Supported capacities:
  - 360K
  - 720K
  - 1.2M
  - 1.44M
  - 2.88M
- Supported transfer rates
  - 250Kbps
  - 300Kbps
  - 500Kbps

- 1Mbps
- 2Mbps

- 3-mode FDD and Win95/98 driver supported

The FDD controller is interfaced to a FDD connected to the backplane through the board-to-board connectors.

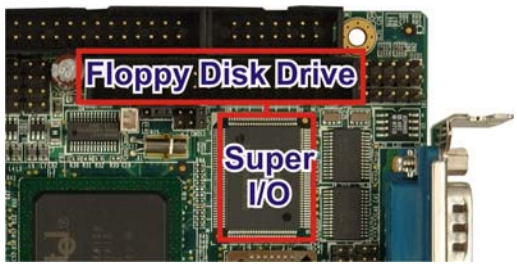


Figure 2-19: Super I/O Floppy Disk Drive Controller

2.7.2.9 Fan Speed and Fan Control

The super I/O can monitor the fan speed. The super I/O is interfaced to the fan on the backplane through the board-to-board connectors.

2.8 PCI Bus Components

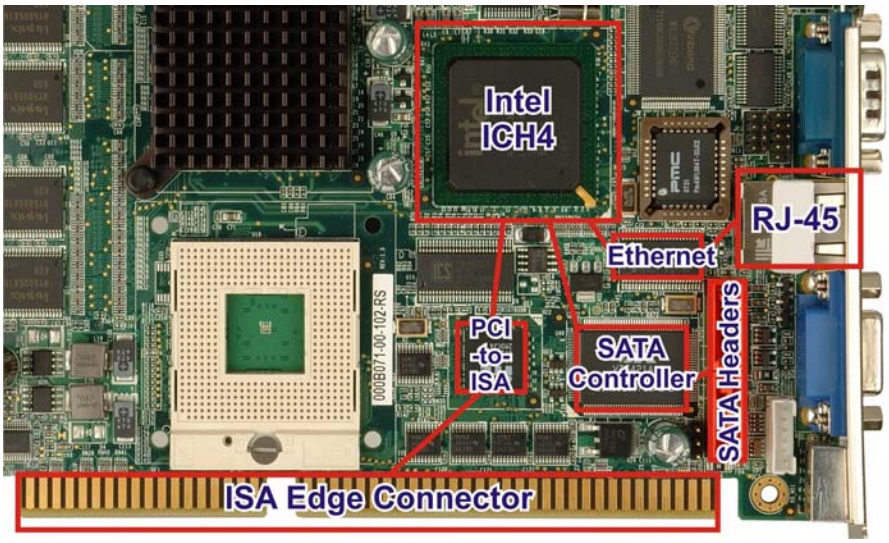


Figure 2-20: PCI Interface

The PCI bus is connected to one of the two components listed below:

- Intel® EP82562ET Ethernet controller
- VIA® VT6421A SATA controller
- ITE PCI-to-ISA chipset

The PCI bus complies with PCI Local Bus Specification, Revision 2.2, supports 33MHz PCI operations and 133MBps maximum throughput.

2.8.1 Intel® EP82562ET Ethernet Controller

The Intel® 82562ET is an IEEE 10BASE-T and 100BASE-TX Ethernet controller that connects the Southbridge chipset to the LAN RJ-45 connector. The Intel® 82562ET is designed for 10Mbps or 100Mbps Ethernet systems.

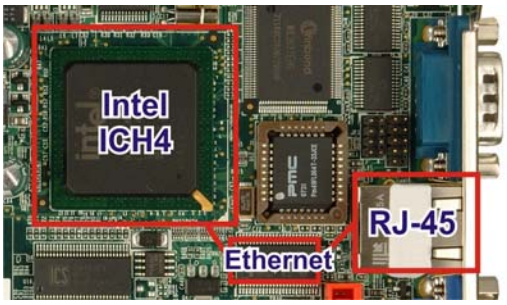


Figure 2-21: Ethernet Controller

Some features of the Intel® EP82562ET Ethernet controller are written below:

- IEEE 802.3 10BASE-T/100BASE-TX compliant physical layer interface
- IEEE 802.3u Auto-Negotiation support
- Digital Adaptive Equalization control
- Link status interrupt capability
- XOR Tree mode support for board testing
- 3-port LED support (speed, link and activity)
- 10BASE-T auto-polarity correction
- Diagnostic loopback mode
- 1:1 transmit transformer ratio support
- Low power (less than 300 mW in active transmit mode)
- Reduced power in “unplugged mode” (less than 50 mW)
- Automatic detection of “unplugged mode”
- 3.3 V device
- 48-pin Shrink Small Outline Package
- Platform LAN connect interface support

2.8.2 VIA® VT6421A SATA Drive Controller

A VIA® VT6421A SATA drive controller is connected to two SATA drive connectors and interfaced to the system through the PCI bus.

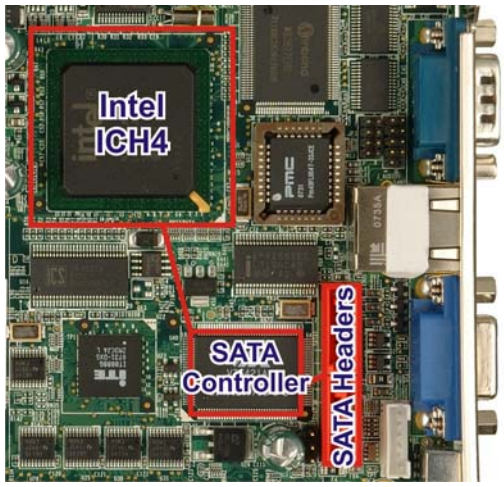


Figure 2-22: SATA Drive Controller

The VIA® VT6421A SATA drive controller has the following features:

- RAID 0, RAID 1 and JBOD
- 33 MHz operation
- Support PCI 2x mode and PCI native modes
- PCI specification revision 2.2 compliant
- Serial ATA Specification Revision 1.0 compliant
- Data rates of up to 1.5 Gbps per SATA channel

2.8.3 ITE IT8888G PCI-to-ISA Bridge

An ITE IT8888G PCI to ISA bridge single function device enables legacy ISA card expansion on the backplane. The PCI to ISA bridge is shown in **Figure 2-23**.

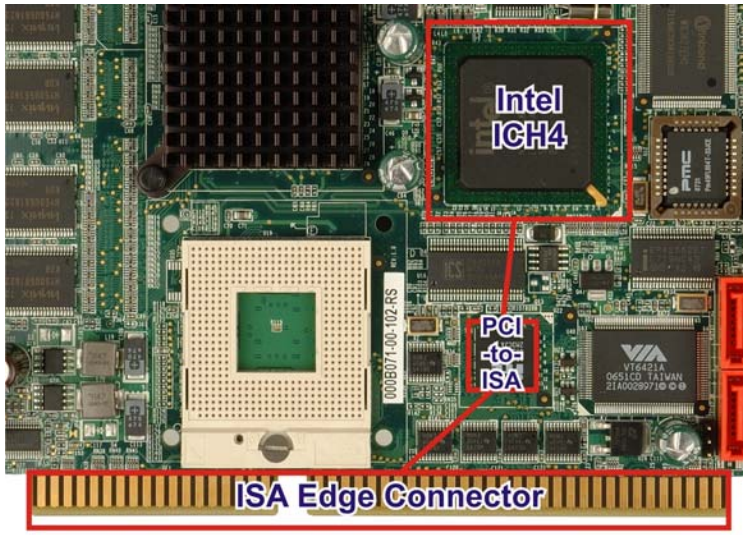


Figure 2-23: PCI-to-ISA Bridge

The IT8888G has a PCI specification v2.1 compliant 32-bit PCI bus interface and supports both PCI Bus master and slave. The PCI interface supports both programmable positive and full subtractive decoding schemes. Some of the features of the IT8888G PCI to ISA bridge are listed below.

- PCI Interface
- Programmable PCI Address Decoders
- PC/PCI DMA Controller
- Distributed DMA Controller
- ISA Interface
- SM Bus
- 1 analog line-level mono output: MONO_OUT
- Power-on Serial Bus Configuration
- Serial IRQ
- Versatile power-on strapping options
- Supports NOGO function

- Single 33 MHz Clock Input
- +3.3V PCI I/F with +5V tolerant I/O buffers
- +5V ISA I/F and core Power Supply

2.9 Environmental and Power Specifications

2.9.1 System Monitoring

Three thermal inputs on the IOWA-8522 Super I/O Enhanced Hardware Monitor monitors the following temperatures:

- System temperature
- CPU temperature

Eight voltage inputs on the IOWA-8522 Super I/O Enhanced Hardware Monitor monitors the following voltages:

- Vcore
- AVCC
- 3VCC
- +12V
- VTT
- GMCH
- +3.3V
- +2.5V
- VSB
- VBAT

2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the IOWA-8522 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. A heat sink is also mounted on the Northbridge chipset to ensure the operating temperature remains low.

2.9.3 Power Consumption

Table 2-2 shows the power consumption parameters for the IOWA-8522 running with a 2.0 GHz Intel® Pentium® M processor and 1 GB DDR RAM.

Voltage	Current
5 V	5.29 A
12 V	0.13 A

Table 2-2: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IOWA-8522 may result in permanent damage to the IOWA-8522 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IOWA-8522. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IOWA-8522, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IOWA-8522, place it on an antic-static pad. This reduces the possibility of ESD damaging the IOWA-8522.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking Precautions

When the IOWA-8522 is unpacked, please do the following:

- Follow the anti-static precautions outlined in Section 3.1.
- Make sure the packing box is facing upwards so the IOWA-8522 does not fall out of the box.
- Make sure all the components shown in Section 3.3 are present.

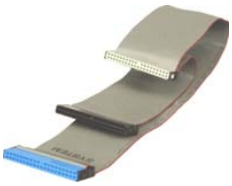
3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IOWA-8522 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The IOWA-8522 is shipped with the following components:

Quantity	Item and Part Number	Image
1	IOWA-8522	
1	HDD cable (P/N: 32200-000052-RS)	
1	KB/MS PS/2 Y-cable (P/N: 32000-000138-RS)	
1	USB cable (P/N: CB-USB02-RS)	
2	SATA cables (P/N: 32000-062800-RS)	

Quantity	Item and Part Number	Image
1	SATA power cable (P/N: 32100-088600-RS)	
1	Dual RSS-232 (w/o bracket) (P/N: 19800-000051-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.3.2 Optional Components

The following components are optional:

Item and Part Number	Image
CPU cooler (**P/N**: CF-479B-RS)	

Table 3-2: Optional Components

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.1 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section** 4.1.1.

4.1.1 Layout

Figure 4-2 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

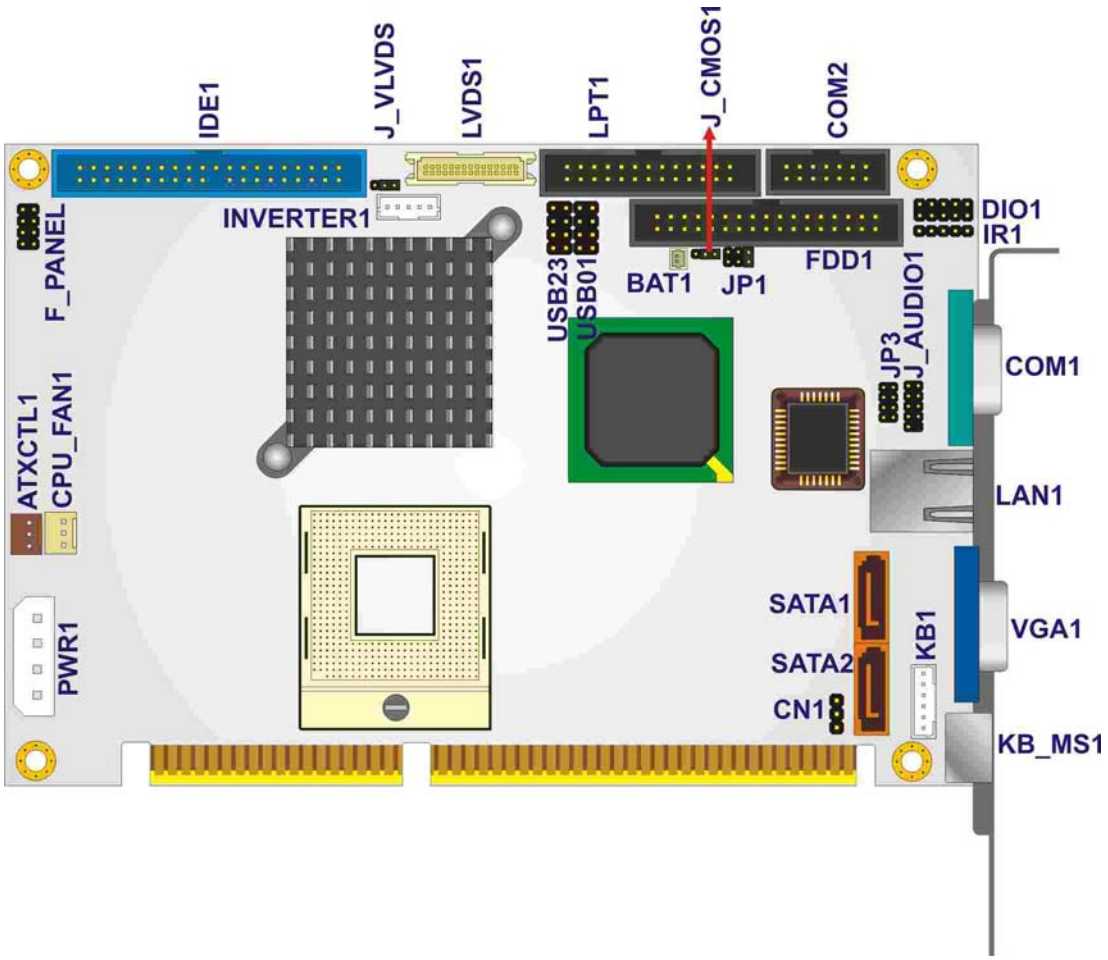


Figure 4-1: Connector and Jumper Locations

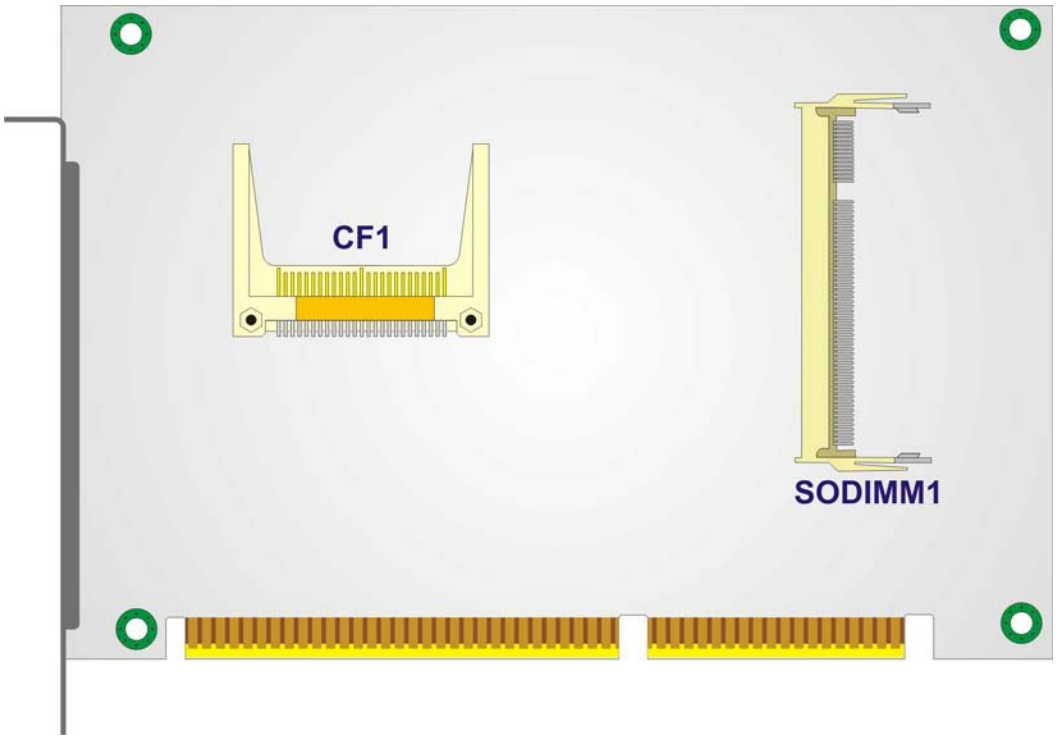


Figure 4-2: Solder Side Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-2 shows a list of the peripheral interface connectors on the IOWA-8522. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
AT power connector	4-pin header	PWR1
ATX power control connector	3-pin connector	ATXCTL1
Audio connector	10-pin header	J_AUDIO1
Backlight inverter connector	5-pin wafer	INVERTER1
Battery connector	2-pin header	BT1
CompactFlash® connector	CF connector	CF1
CPU fan connector	3-pin wafer	CPU_FAN1
DDR SO-DIMM memory socket	200-pin connector	SODIMM1

Connector	Type	Label
Digital I/O connector	10-pin header	DIO1
Floppy disk drive connector	34-pin box header	FDD1
Front panel connector	8-pin header	F_PANEL1
IDE connector	40-pin box header	IDE1
Infrared connector	5-pin header	IR1
Keyboard connector	6-pin wafer	KB1
LVDS connector	30-pin crimp	LVDS1
Parallel port connector	26-pin header	LPT1
RS-232 serial port connector	14-pin header	COM2
SATA drive connector	7-pin SATA	SATA1
SATA drive connector	7-pin SATA	SATA2
USB connector	8-pin header	USB01
USB connector	8-pin header	USB23

Table 4-1: Peripheral Interface Connectors

4.1.3 External Peripheral Interface Panel Connectors

Table 4-3 lists the external peripheral interface panel connectors on the IOWA-8522. Detailed descriptions of these connectors can be found in.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Keyboard/Mouse	PS/2	KB_MS1
Serial port	DB-9 (male)	COM1
VGA port connector	DB-15 (female)	VGA1

Table 4-2: External Peripheral Interface Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IOWA-8522.

4.2.1 Power Supply Connector

CN Label: **PWR1**

CN Type: 4-pin power connector (4x1)

CN Location: See Figure 4-3

CN Pinouts: See Table 4-3

The 4-pin power supply connector is connected to the power supply.

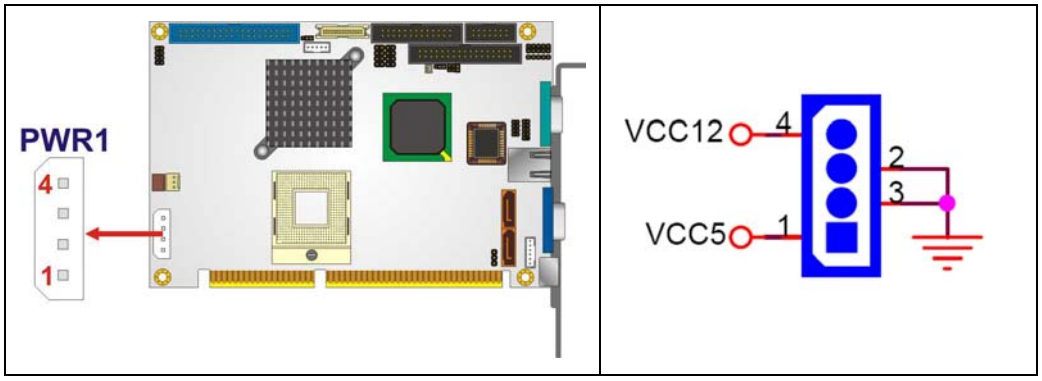


Figure 4-3: Power Connector Location

PIN	DESCRIPTION
1	+5 V
2	GND
3	GND
4	+12 V

Table 4-3: Power Connector Pinouts

4.2.2 ATX Power Supply Enable Connector

CN Label: **ATXCTL1**

CN Type: 3-pin wafer (1x3)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-4**

The ATX power supply enable connector enables the IOWA-8522 to be connected to an ATX power supply. In default mode, the IOWA-8522 can only us an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured. Please refer to Chapter 3 for more details.

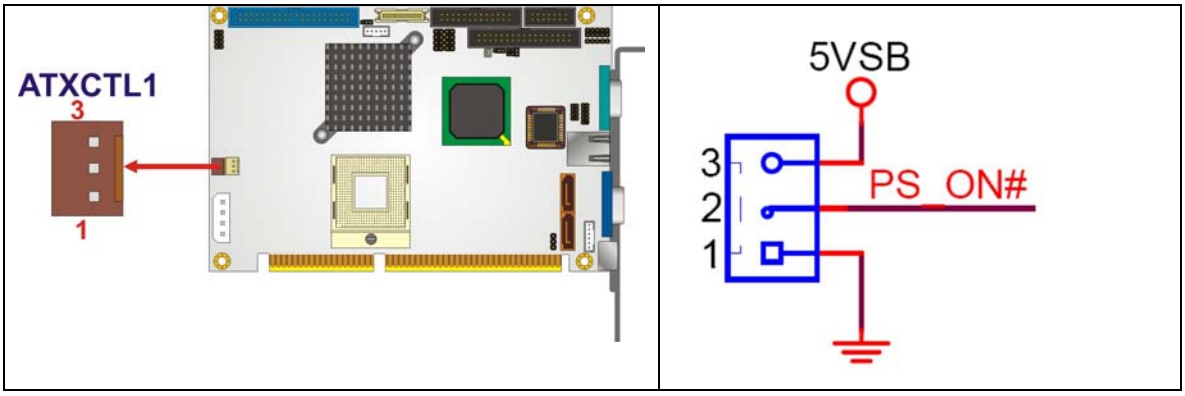


Figure 4-4: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	GND
2	PS_ON#
3	5VSB

Table 4-4: ATX Power Supply Enable Connector Pinouts

4.2.3 Audio Connector (10-pin)

CN Label: **J_AUDIO1**

CN Type: 10-pin header

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-5**

The 9-pin audio connector is connected to an optional 5.1 channel audio kit.

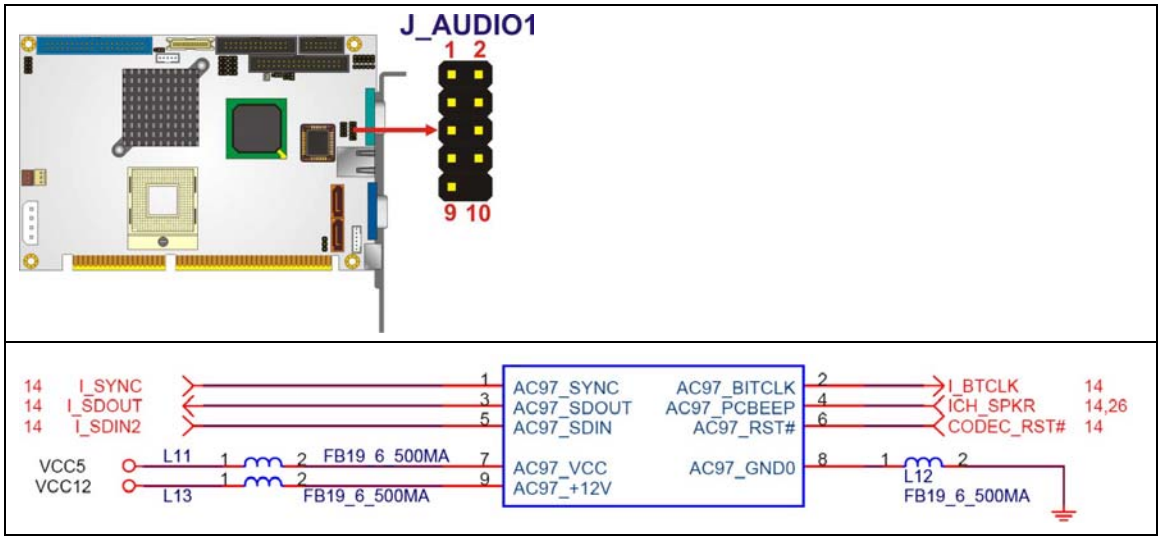


Figure 4-5: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SYNC	2	BITCLK
3	SDOUT	4	PCBEEP
5	SDIN	6	RST#
7	VCC	8	GND
9	+12V		

Table 4-5: Audio Connector Pinouts (9-pin)

4.2.4 Backlight Inverter Connector

CN Label:	**INVERTER1**
CN Type:	5-pin wafer (1x5)
CN Location:	See **Figure 4-6**
CN Pinouts:	See **Table 4-6**

The backlight inverter connector provides the backlight on the LCD display connected to the IOWA-8522 with +12V of power.

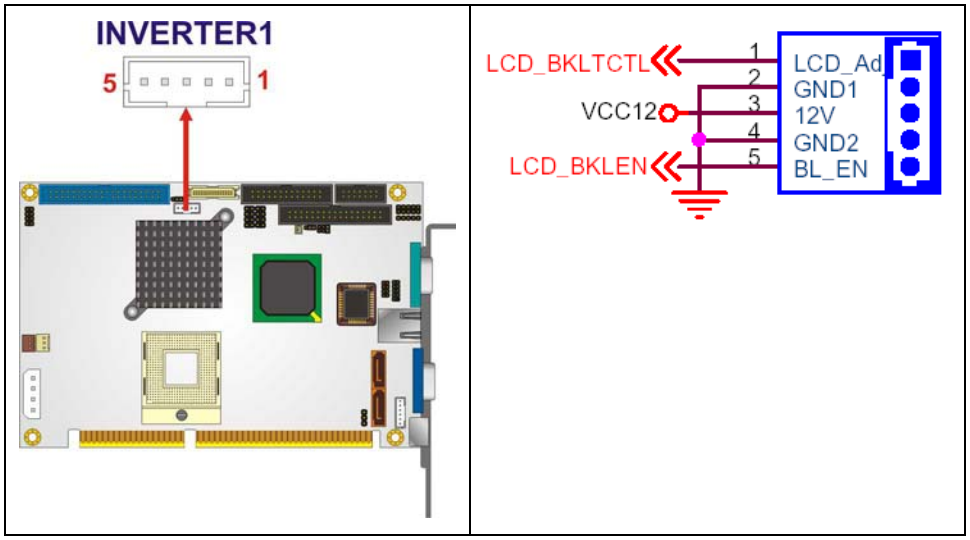


Figure 4-6: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	BL_ADJ
2	GND
3	12V
4	GND
5	BL_EN

Table 4-6: Panel Backlight Connector Pinouts

4.2.5 Battery Connector

CN Label: **BT1**

CN Type: 2-pin wafer (1x2)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-7**

The battery connector is connected to a backup battery. The battery connector is also used to reset the CMOS memory if the incorrect BIOS settings have been made and the system cannot boot up.

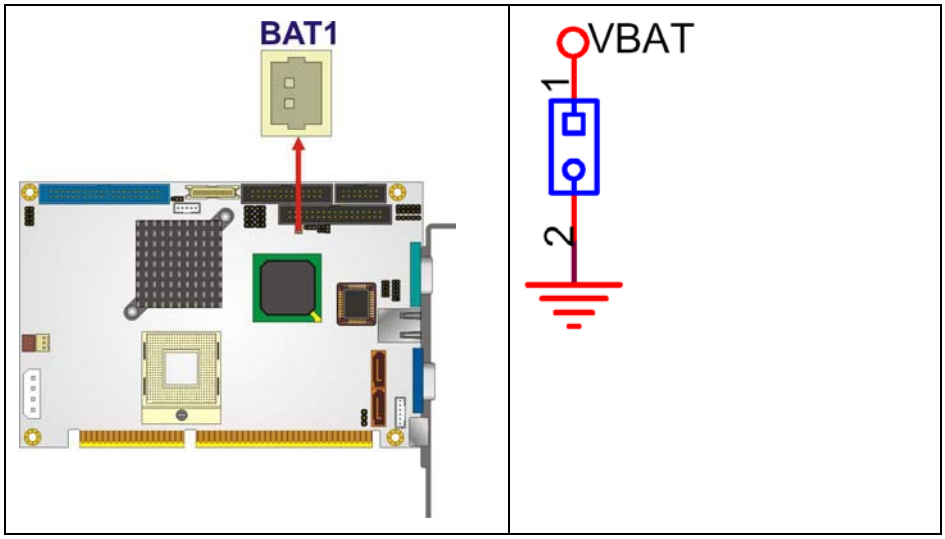


Figure 4-7: Battery Connector Location

PIN NO.	DESCRIPTION
1	Battery+
2	Ground

Table 4-7: Battery Connector Pinouts

4.2.6 CompactFlash® Socket

CN Label:	**CF1** (solder side)
CN Type:	50-pin header (2x25)
CN Location:	See **Figure 4-8**
CN Pinouts:	See **Table 4-8**

A CompactFlash® Type I or Type II memory card is inserted to the CF socket on the solder side of the IOWA-8522.

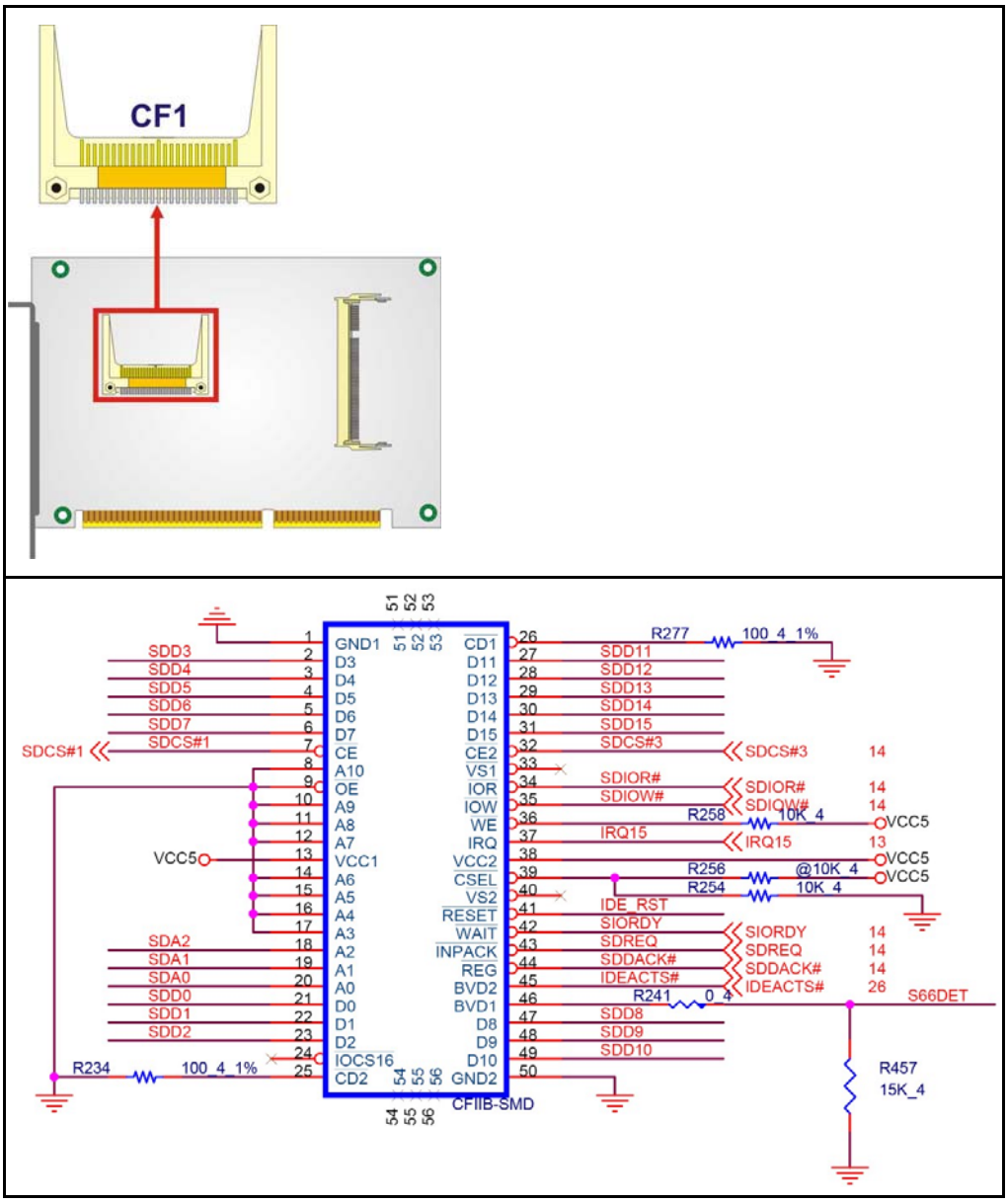


Figure 4-8: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	CD1
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GROUND	33	N/C
9	GROUND	34	SDIOR#
10	GROUND	35	SDIOW#
11	GROUND	36	VCC5
12	GROUND	37	IRQ15
13	VCC5	38	VCC5
14	GROUND	39	Master/Slave Select
15	GROUND	40	N/C
16	GROUND	41	IDERST#
17	GROUND	42	SIORDY
18	SDA2	43	SDREQ
19	SDA1	44	SDDACK#
20	SDA0	45	IDEACTS#
21	SDD0	46	CF2
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/C	49	SDD10
25	GROUND	50	GROUND

Table 4-8: CF Card Socket Pinouts

4.2.7 CPU Fan Connector

CN Label: CPU_FAN1

CN Type: 3-pin wafer connector

CN Location: See Figure 4-9

CN Pinouts: See Table 4-9

The FAN1 cooling fan connector provides a 12V current to the cooling fan. The connector has a "rotation" pin to get rotation signals from the fan and notify the system so the system BIOS can recognize the fan speed. Please note that only certain fans can issue the rotation signals.

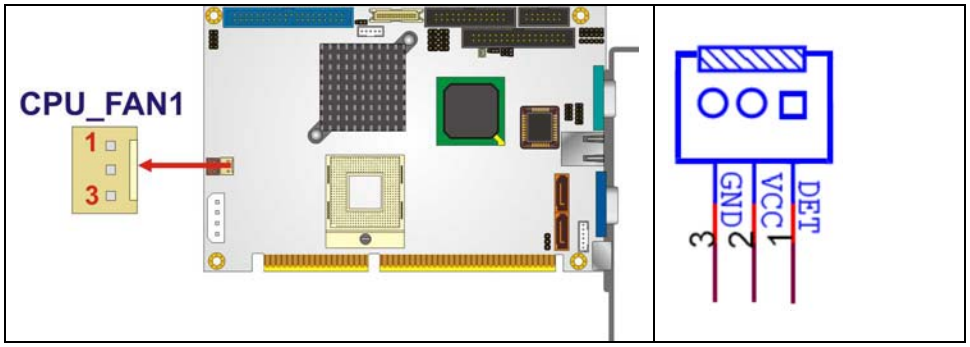


Figure 4-9: Fan Connectors Locations

PIN	FAN1
1	DET
2	VCC
3	GND

Table 4-9: Fan Connectors Pinouts

4.2.8 Digital Input/Output (DIO) Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-10

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

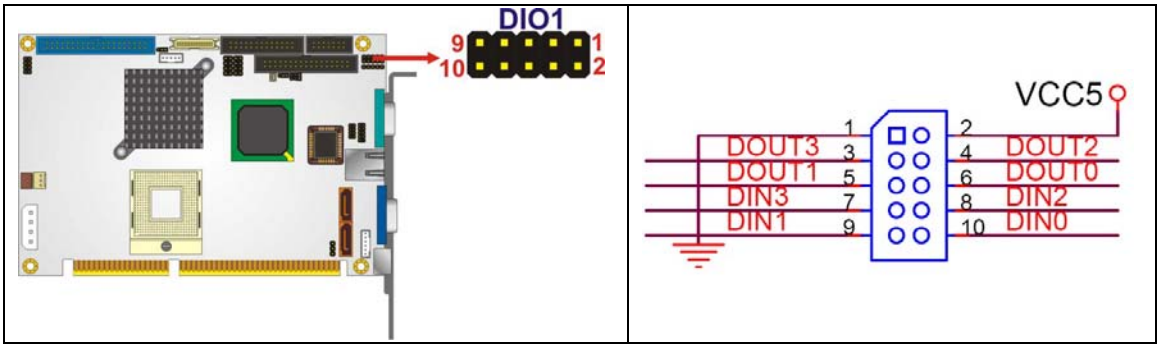


Figure 4-10: DIO Connector Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	VCC5
3	DOUT3	4	DOUT2
5	DOUT1	6	DOUT0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

Table 4-10: DIO Connector Pinouts

4.2.9 Floppy Disk Connector (34-pin)

CN Label: **FDD1**

CN Type: 34-pin header (2x17)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-11**

The floppy disk connector is connected to a floppy disk drive.

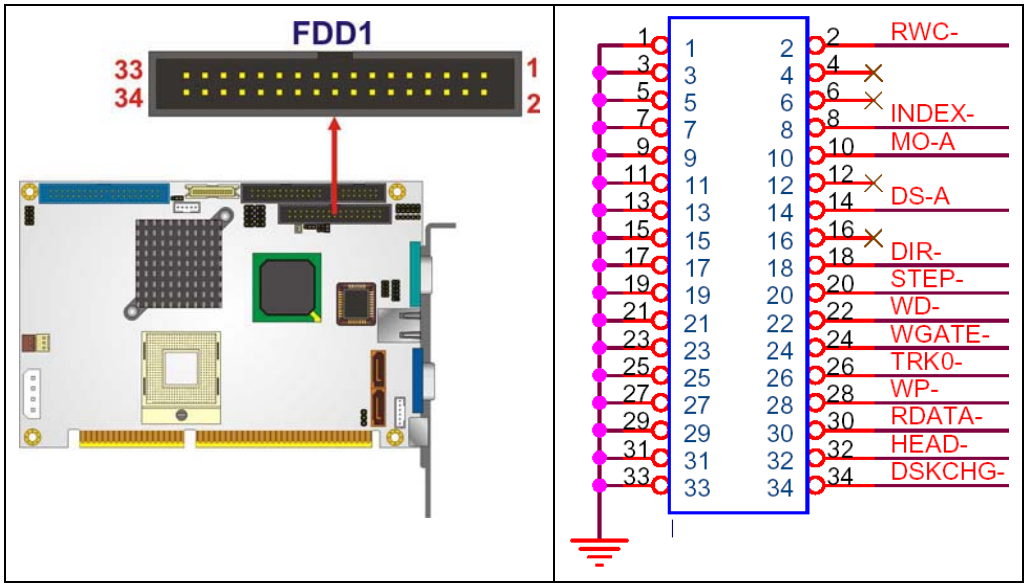


Figure 4-11: 34-pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#

17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 4-11: 34-pin FDD Connector Pinouts

4.2.10 Front Panel Connector (8-pin)

CN Label: **F_PANEL1**

CN Type: 8-pin header (2x4)

CN Location: See Error! Reference source not found.

CN Pinouts: See Error! Reference source not found.

The front panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Speaker
- Power LED
- HDD LED

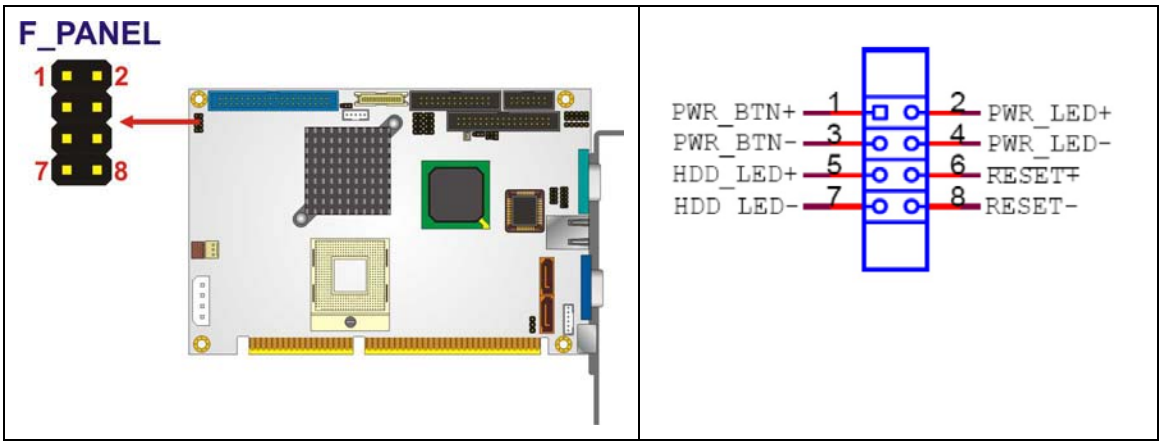


Figure 4-12: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power Button	1	PWR_BTN+	Power LED	2	PWR_LED+
	3	PWR_BTN-		4	PWR_LED-
HDD LED	5	HDD_LED+	Reset	6	RESET+
	7	HDD_LED-		8	RESET-

Table 4-12: Front Panel Connector Pinouts

4.2.11 IDE Connector(40-pin)

CN Label: **IDE1**

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-13

CN Pinouts: See Table 4-13

One 40-pin IDE connector on the IOWA-8522 supports connectivity to up to two IDE devices.

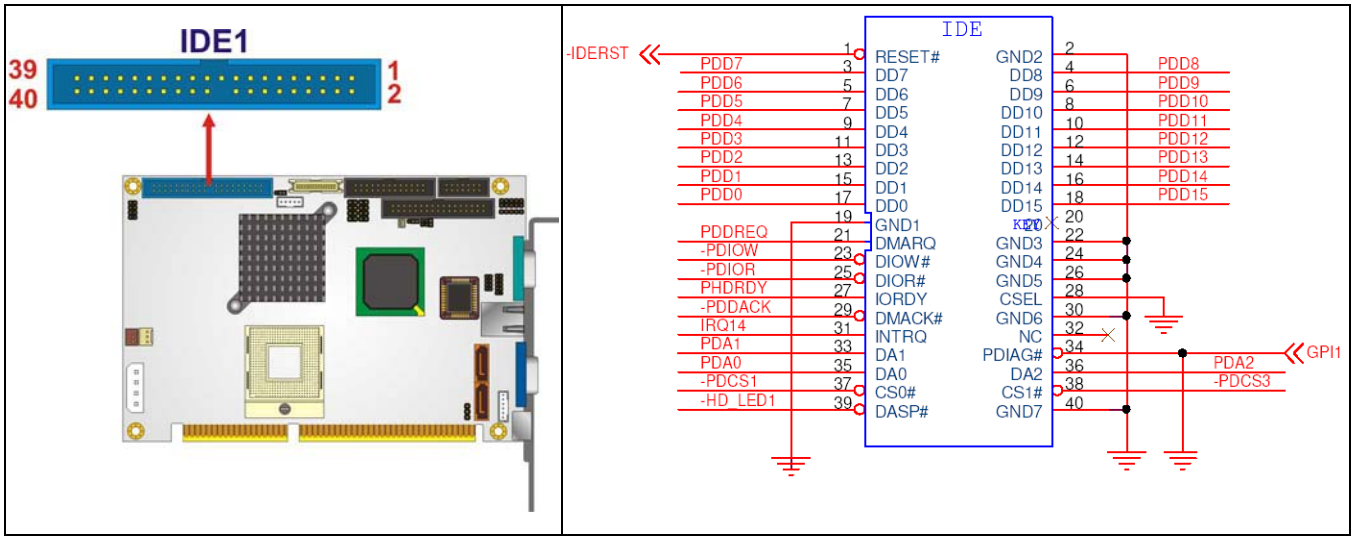


Figure 4-13: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
17	DATA 0	18	DATA 15
19	GROUND	20	N/C (KEY)
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	PCIAG#
35	SA0	36	DA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

Table 4-13: IDE Connector Pinouts

4.2.12 Infrared Interface Connector (5-pin)

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-14

CN Pinouts: See Table 4-14

The infrared interface connector supports consumer remote control frequencies, like those used in remote controls.

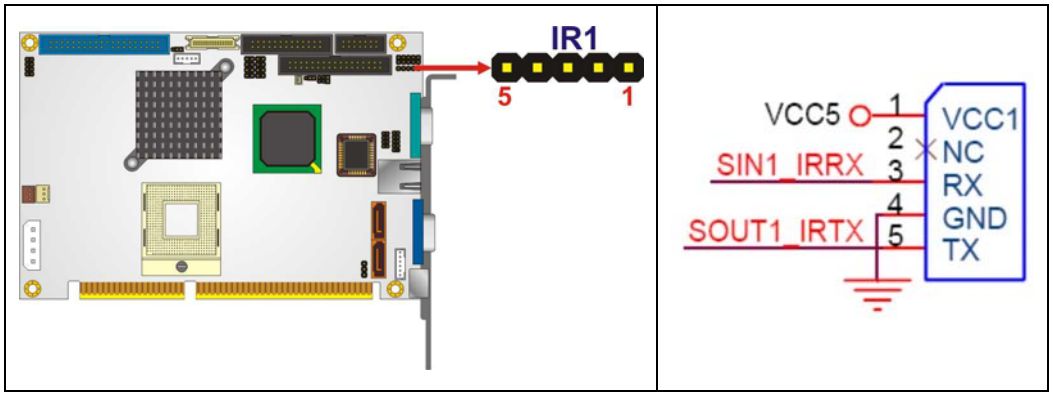


Figure 4-14: Infrared Connector Pinout Locations

PIN	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-14: Infrared Connector Pinouts

4.2.13 Keyboard/Mouse Connector

CN Label: **KB1**

CN Type: 6-pin header (1x6)

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-15**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.

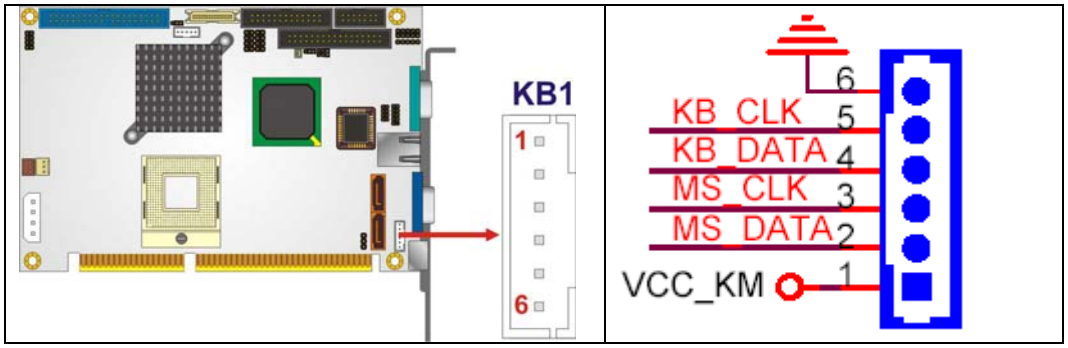


Figure 4-15: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	+5V KB DATA
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 4-15: Keyboard/Mouse Connector Pinouts

4.2.14 LVDS LCD Connector

CN Label:	**LVDS1**
CN Type:	30-pin crimp (2x10)
CN Location:	See **Figure 4-16**
CN Pinouts:	See **Table 4-16**

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.

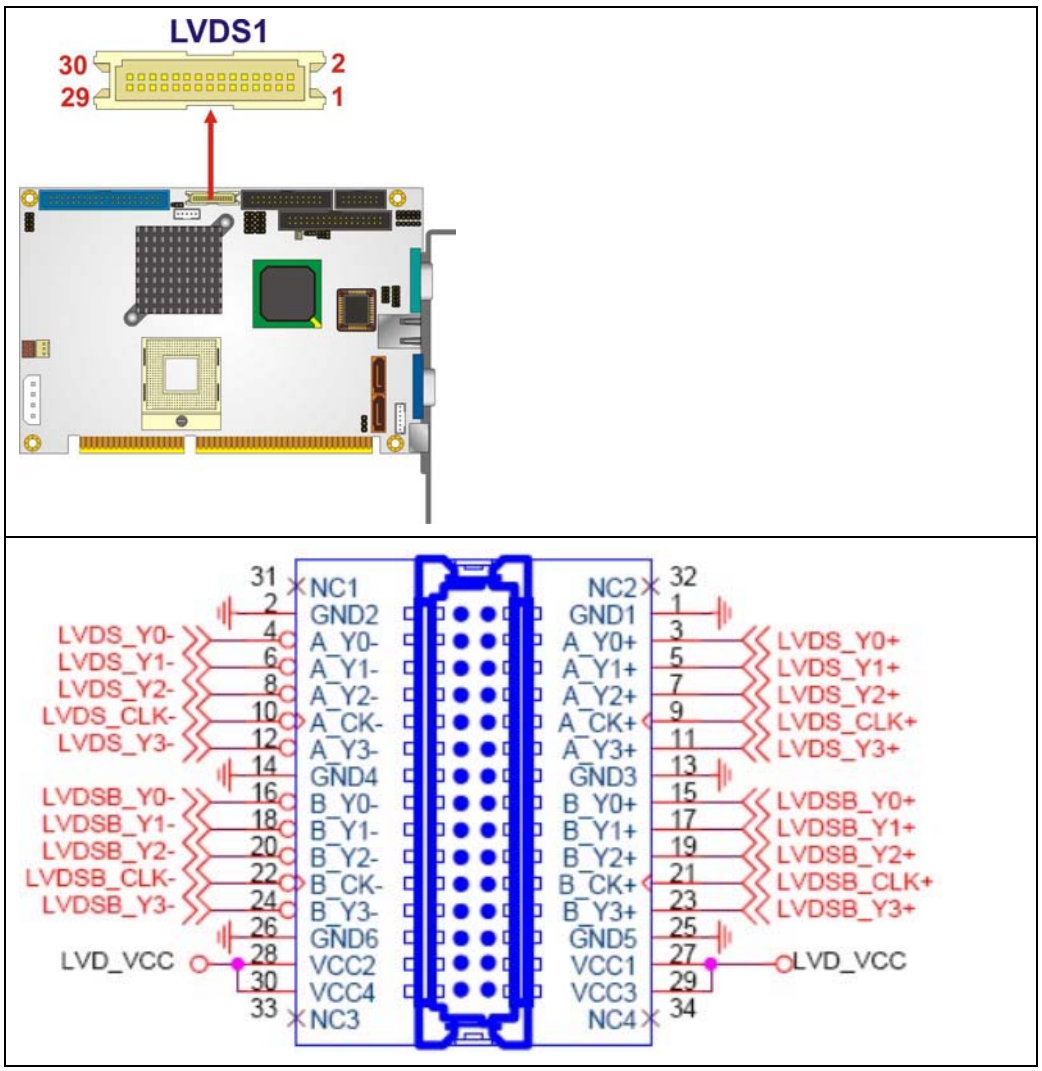


Figure 4-16: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	GROUND
3	LVDSA_Y0+	4	LVDSA_Y0-
5	LVDSA_Y1+	6	LVDSA_Y1-
7	LVDSA_Y2+	8	LVDSA_Y2-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	LVDSA_Y3+	12	LVDSA_Y3-
13	GROUND	14	GROUND
15	LVDSB_Y0+	16	LVDSB_Y0-
17	LVDSB_Y1+	18	LVDSB_Y1-
19	LVDSB_Y2+	20	LVDSB_Y2-
21	LVDSB_CLK+	22	LVDSB_CLK-
23	LVDSB_Y3+	24	LVDSB_Y3-
25	GROUND	26	GROUND
27	VCC_LVDS	28	VCC_LVDS
29	VCC_LVDS	30	VCC_LVDS

Table 4-16: LVDS LCD Port Connector Pinouts

4.2.15 Parallel Port Connector

CN Label: **LPT1**

CN Type: 26-pin box header

CN Location: See Figure 4-17

CN Pinouts: See Table 4-17

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

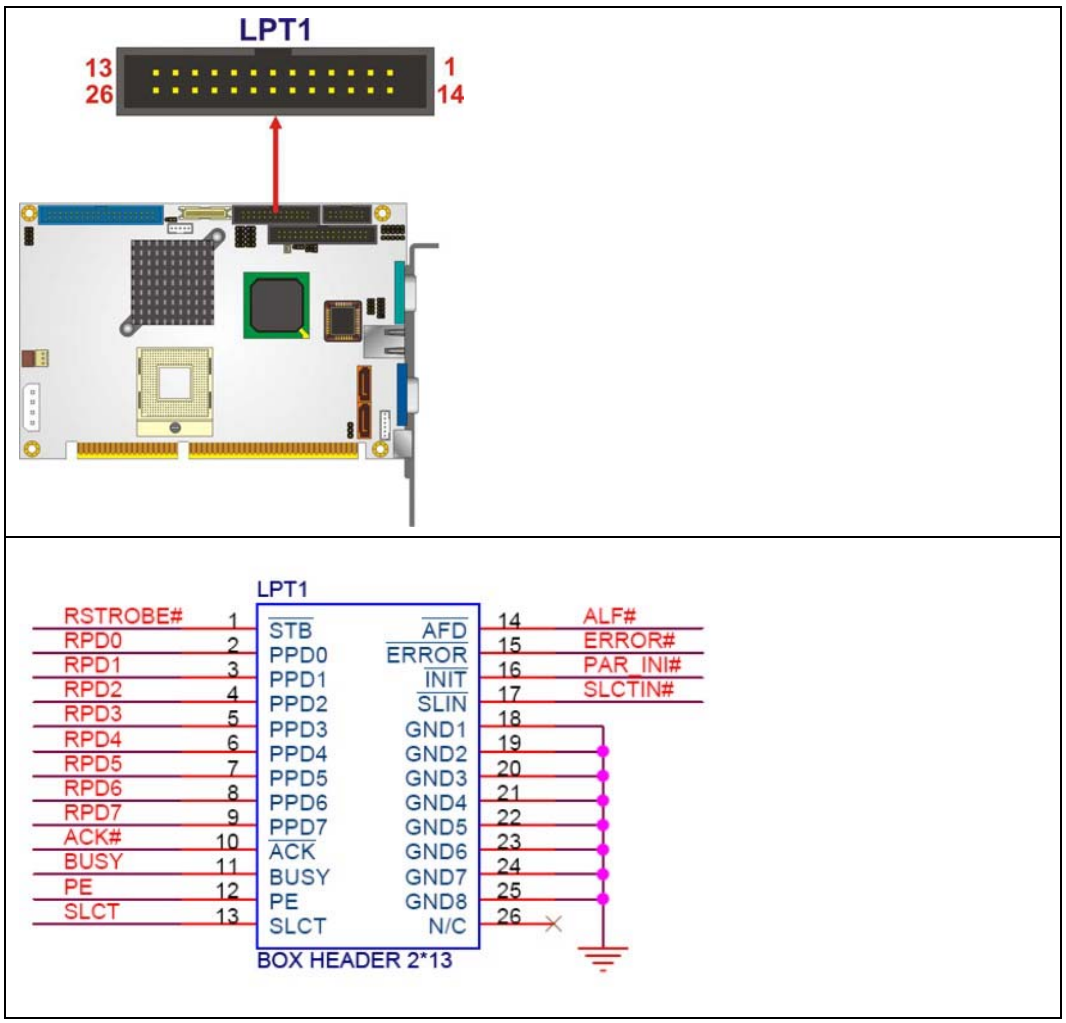


Figure 4-17: Parallel Port Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RSTROBE#	14	ALF#
2	RPD0	15	ERROR#
3	RPD1	16	PAR_INI#
4	RPD2	17	SLCTIN#
5	RPD3	18	GND1
6	RPD4	19	GND2
7	RPD5	20	GND3
8	RPD6	21	GND4
9	RPD7	22	GND5
10	ACK#	23	GND6
11	BUSY	24	GND7
12	PE	25	GND8
13	SLCT	26	N/C

Table 4-17: Parallel Port Connector Pinouts

4.2.16 SATA Drive Connectors

CN Label: **SATA1, SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-18

CN Pinouts: See Table 4-18

The SATA drive connectors are connected to SATA 1.5Gb/s disk drives that transfer data at speeds as high as 1.5Gb/s. The SATA drives can be configured in a RAID 0, RAID 1 or JBOD configuration.

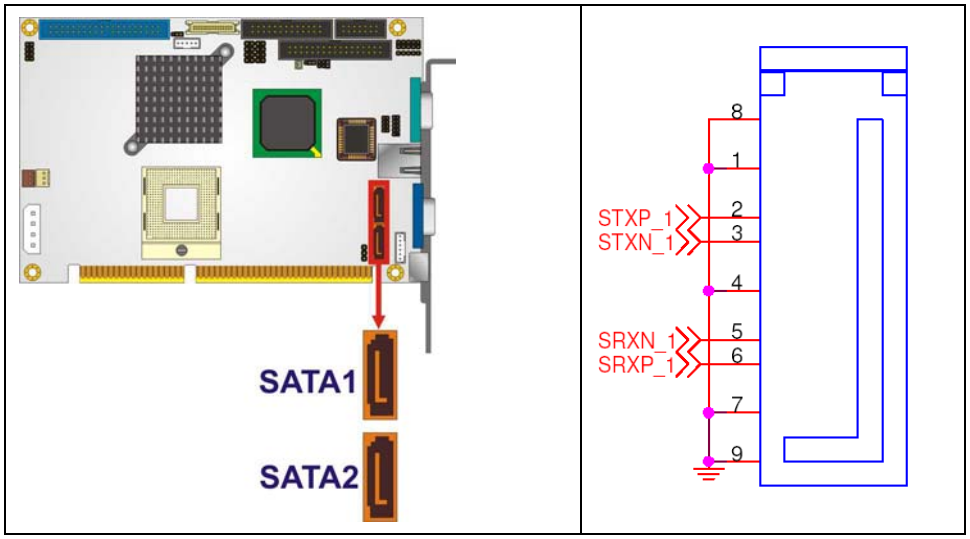


Figure 4-18: SATA Drive Connector Locations

PIN	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+

PIN	DESCRIPTION
7	GND

Table 4-18: SATA Drive Connector Pinouts

4.2.17 Serial Port Connector (COM2)(RS-232, RS-422 or RS-485)

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-19

CN Pinouts: See Table 4-19

The 14-pin serial port connector connects to the COM 2 serial communications channels. COM 2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the COM 2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

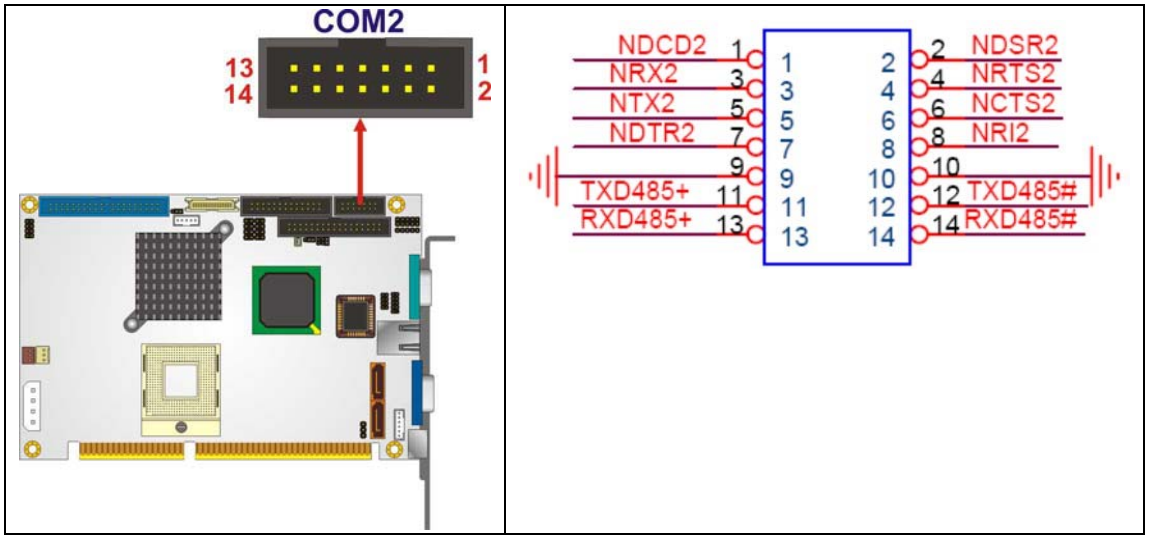


Figure 4-19: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD2	8	NDSR2
2	NRX2	9	NRTS2
3	NTX2	10	NCTS2
4	NDTR2	11	NRI2
5	GND	12	GND
6	TXD485+	13	TXD485#
7	RXD485+	14	RXD485#

Table 4-19: RS-232/RS-485 Serial Port Connector Pinouts

4.2.18 USB Connectors

CN Label: **USB01, USB23**

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-20

CN Pinouts: See Table 4-20

The 2x4 USB pin connector provides connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

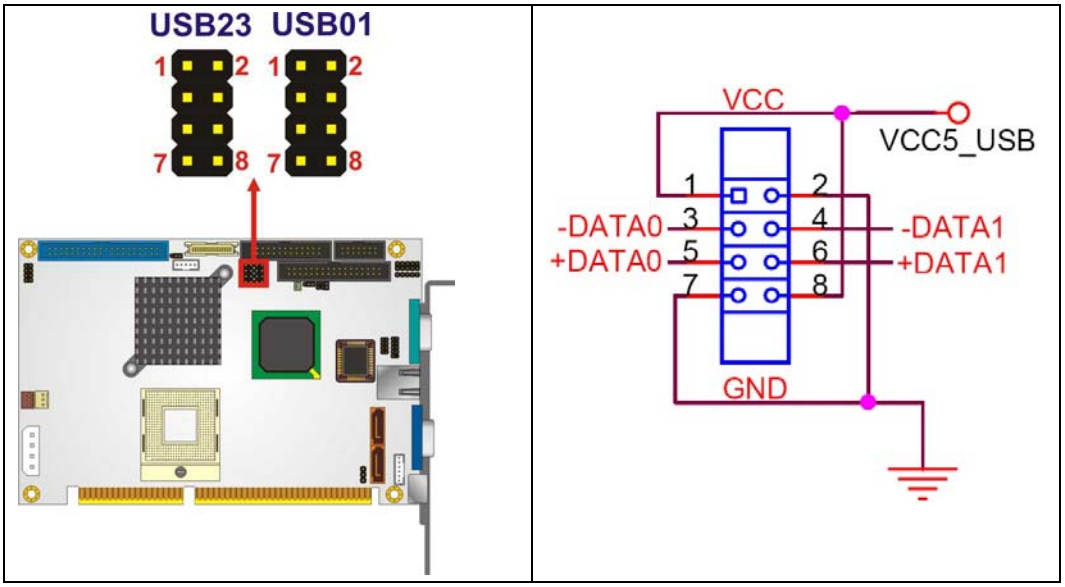


Figure 4-20: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 4-20: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

Figure 4-21 shows the IOWA-8522 external peripheral connector panel. The peripheral connectors on the panel can be connected to devices externally when the motherboard is installed in a chassis. The external peripheral connectors are:

- 1 x Keyboard/Mouse connector
- 1 x RJ-45 Ethernet connector
- 1 x Serial port
- 4 x USB 2.0 ports
- 1 x VGA connector

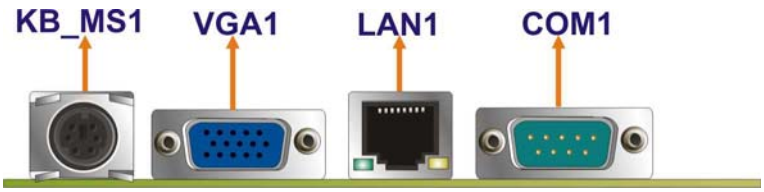


Figure 4-21: IOWA-8522 External Peripheral Connector Panel

4.3.1 Keyboard/Mouse Connector

CN Label: **KB_MS1**

CN Type: PS/2

CN Location: See **Figure 4-22**

CN Pinouts: See **Table 4-21**

The IOWA-8522 keyboard and mouse connector is a standard PS/2 connector.

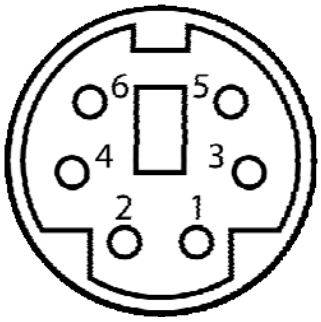


Figure 4-22: PS/2 Pinout and Configuration

PIN	DESCRIPTION
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

Table 4-21: PS/2 Connector Pinouts

4.3.2 Ethernet Connector

CN Label: **LAN1**

CN Type: RJ-45 ports

CN Location: See **Figure 4-23**

CN Pinouts: See **Table 4-22** and **Table 4-23**

A 10/100 Mb/s connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX0+	7	TX3+
2	TX0-	8	TX3-
3	TX1+	9	Active +
4	TX1-	10	Active -
5	TX2+	11	LINK +
6	TX2-	12	LINK -

Table 4-22: Ethernet Connector Pinouts

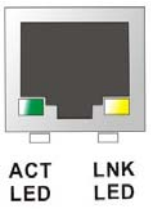


Figure 4-23: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked (**Table 4-23**).

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 4-23: Ethernet Connector LEDs

4.3.3 Serial Port Connector

CN Label: **COM1**

CN Type: DB-9 connector

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-24** and **Figure 4-24**

The 9-pin DB-9 COM 1 serial port connector is connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-24: RS-232 Serial Port (COM 1) Pinouts

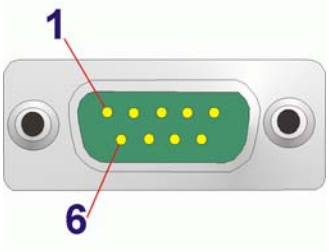


Figure 4-24: COM1 Pinout Locations

4.3.4 VGA Connector

CN Label: **VGA1**

CN Type: HD-D-sub 15 Female connector

CN Location: See **Figure 4-21**

CN Pinouts: See **Figure 4-25** and **Table 4-25**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

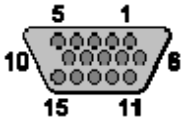


Figure 4-25: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-25: VGA Connector Pinouts

4.4 On-board Jumpers

The IOWA-8522 has three on-board jumpers. Refer to **Section 5.4** for jumper configuration settings.

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Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IOWA-8522 may result in permanent damage to the IOWA-8522 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IOWA-8522. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IOWA-8522, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IOWA-8522, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the PCB***: When handling the PCB, hold it by its edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the IOWA-8522 is installed. All installation notices pertaining to the installation of the IOWA-8522 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IOWA-8522 and injury to the

person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the IOWA-8522 and injury to the user.

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the IOWA-8522 installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the** IOWA-8522 **on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn off all power to the** IOWA-8522:
  - When working with the IOWA-8522, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the IOWA-8522 DO NOT do the following:

- DO NOT remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- DO NOT use the product before verifying all the cables and power connectors are properly connected.
- DO NOT allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2.2 Installation Checklist

The following checklist is provided to ensure the IOWA-8522 is properly installed.

- All the items in the packing list are present (see **Chapter 3**)
- A CPU is installed
- A CPU cooling kit is properly installed
- Compatible memory modules are properly inserted into the memory slots
- The IOWA-8522 is installed into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices (if applicable) are properly connected:
  - IDE device
  - SATA drives
  - ATX power enable
  - LVDS monitor
  - Power switch
  - Reset switch
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
  - Keyboard/mouse cable
  - Network cables
- The following external peripheral devices are properly connected to the chassis:
  - VGA monitor
  - Serial device
  - Keyboard
  - Mouse
  - USB device
  - LAN

5.3 CPU, CPU Cooling Kit and SO-DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, IOWA-8522 and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IOWA-8522. If one of these component is not installed the IOWA-8522 cannot run.

5.3.1 CPU Installation

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

To install a socket 479 CPU onto the IOWA-8522, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to unlock the screw. See **Figure 5-1**.

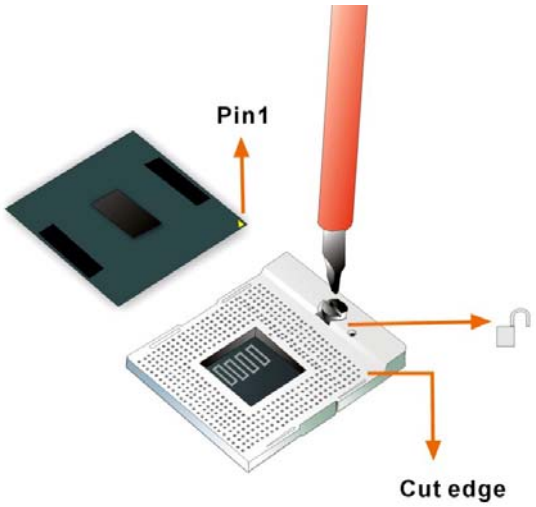

Figure 5-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly Orientate the CPU**. Make sure the IHS (integrated heat sink) side is facing upwards.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket. See **Figure 5-1**.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. See **Figure 5-2**.

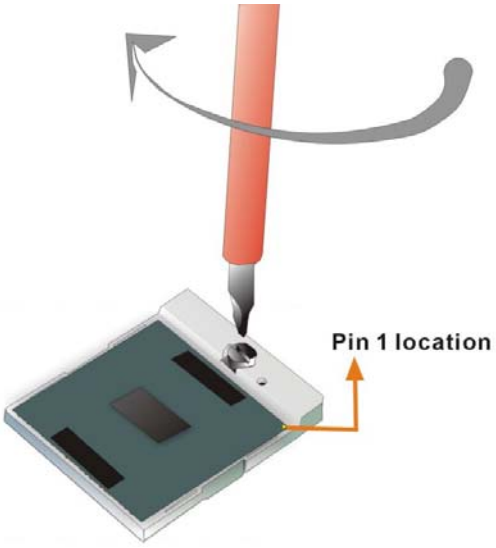

Figure 5-2: Lock the CPU Socket Retention Screw

5.3.2 Cooling Kit Installation

Figure 5-3: Cooling Kit

The CPU cooling kit (**Figure 5-3**) can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of

thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, please follow the steps below.

Step 1: **Align the support bracket.** Remove the tape from the support bracket. From the solder side of the PCB, align the support bracket to the holes on the PCB.

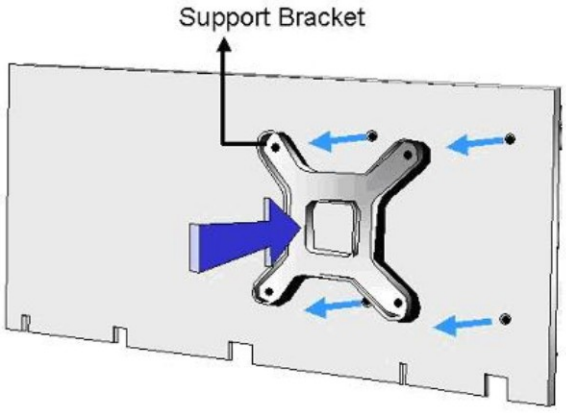

Figure 5-4: Cooling Kit Support Bracket

Step 2: **Place the cooling kit onto the CPU**. Make sure the CPU cooling fan cable can be properly routed when the cooling kit is installed.

Step 3: **Properly align the cooling kit**. Make sure its four spring screw fasteners can pass through the pre-drilled holes on the PCB.

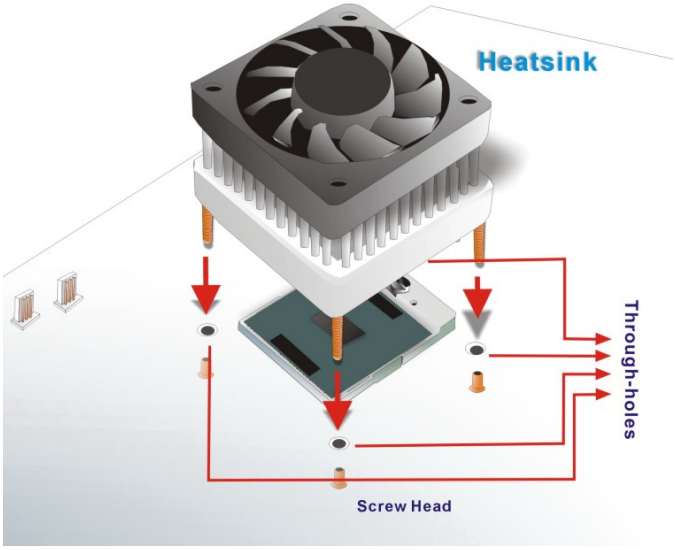

Figure 5-5: Securing the Cooling Kit

Step 4: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws. Over tightening can cause damage to the CPU.

Step 5: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. See **Figure 5-6**.

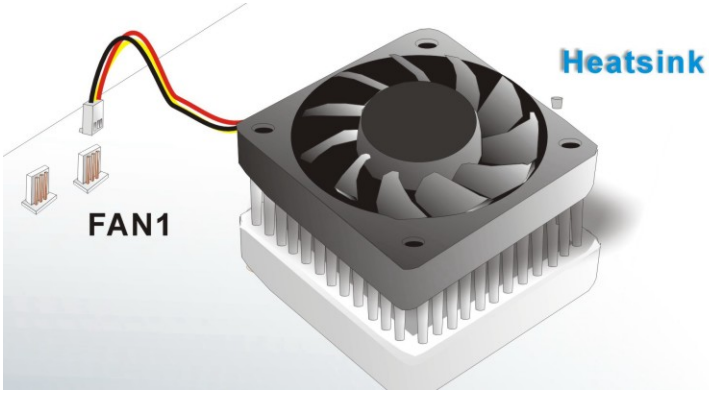

Figure 5-6: Connect the cooling fan cable

5.3.3 SO-DIMM Installation

WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the IOWA-8522. Please make sure the purchased SO-DIMM complies with the memory specifications of the IOWA-8522. SO-DIMM specifications compliant with the IOWA-8522 are listed in **Chapter 2**.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 5-7**.

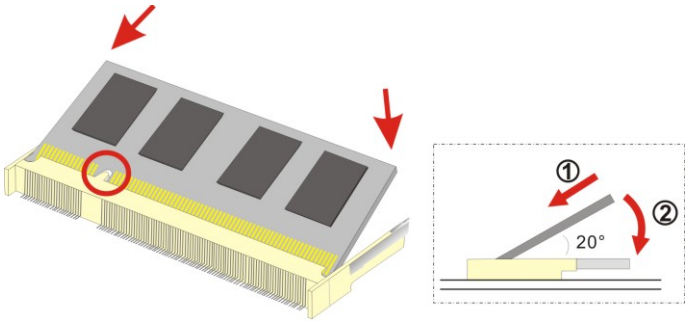

Figure 5-7: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket**. Place the IOWA-8522 on an anti-static pad with the solder side facing up.

Step 2: **Align the SO-DIMM with the socket**. The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 3: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See **Figure 5-7**)

Step 4: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 5-7**)

Step 5: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

5.3.4 CF Card Installation

NOTE:

The IOWA-8522 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

To install the a CF card (Type 1 or Type 2) onto the IOWA-8522, please follow the steps below:

Step 1: **Locate the CF card socket**. Place the IOWA-8522 on an anti-static pad with the solder side facing up. Locate the CF card.

Step 2: **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.

Step 3: **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-8**.

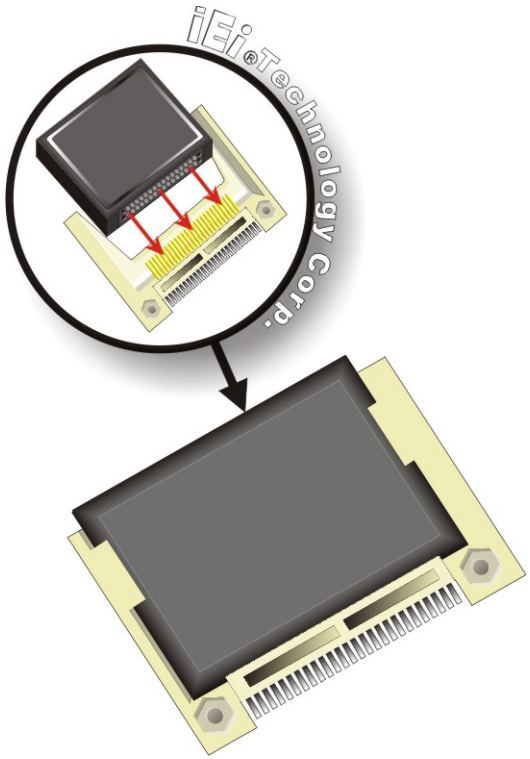

Figure 5-8: CF Card Installation

5.4 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

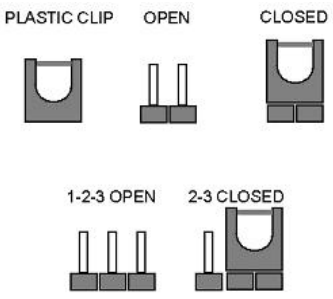

Figure 5-9: Jumper Locations

Before the IOWA-8522 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IOWA-8522 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header
COM2 type selection	JP1	6-pin header
LVDS voltage selector	J_VLVDS1	3-pin header
LVDS screen resolution selector	JP3	8-pin header

Table 5-1: Jumpers

5.4.1 Clear CMOS

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 5-2**

Jumper Location: See **Figure 5-10**

If the IOWA-8522 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in Figure 5-10 below.

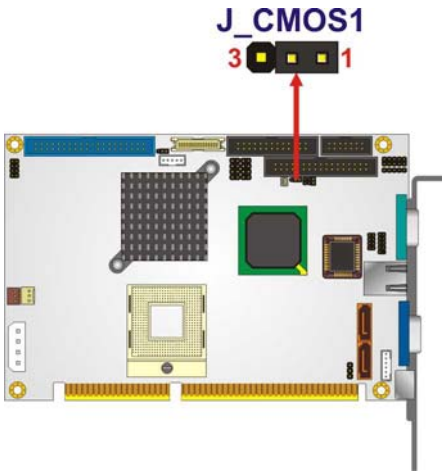

Figure 5-10: Clear CMOS Jumper

5.4.2 COM 2 Function Select Jumper

Jumper Label: **JP1**

Jumper Type: 6-pin header

Jumper Settings: See **Table 5-3**

Jumper Location: See **Figure 5-11**

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 5-3**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	

Table 5-3: COM 2 Function Select Jumper Settings

The COM 2 Function Select jumper location is shown in **Figure 5-11**.

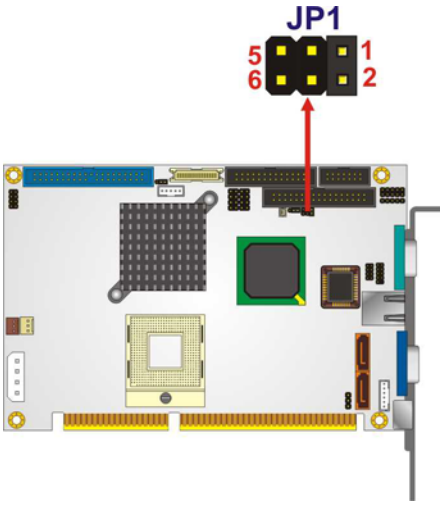

Figure 5-11: COM 2 Function Select Jumper Location

5.4.3 LVDS Voltage Selection

WARNING:

Permanent damage to the screen and IOWA-8522 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that cam with the monitor to select the correct voltage.

Jumper Label:	**J_VLVDS1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-4**
Jumper Location:	See **Figure 5-12**

The **LVDS Voltage Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-4**.

AT Power Select	Description	
Short 1-2	+3.3V LVDS	Default
Short 2-3	+5V LVDS	

Table 5-4: LVDS Voltage Selection Jumper Settings

The LVDS Voltage Selection jumper location is shown in **Figure 5-12**.

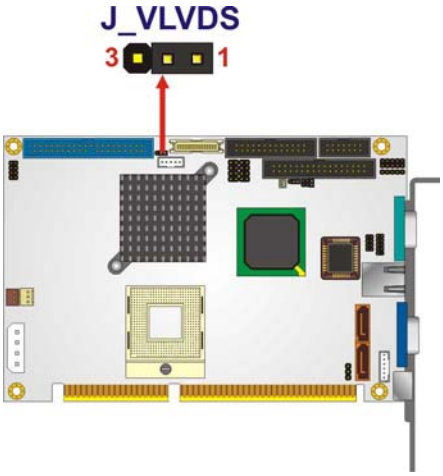

Figure 5-12: LVDS Voltage Selection Jumper Pinout Locations

5.4.4 LVDS Screen Resolution Selection

WARNING:

Permanent damage to the screen and IOWA-8522 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that cam with the monitor to select the correct voltage.

Jumper Label:	**JP3**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-4**
Jumper Location:	See **Figure 5-12**

The **LVDS Screen Resolution Selection** jumper allows the LVDS screen voltage to be set. The **LVDS Screen Resolution Selection** jumper settings are shown in **Table 5-4**.

Jumper Selection	Description	
Open	640 x 480 (18 bit)	Default
Short 1-2	800 x 600 (18 bit)	
Short 3-4	1024 x 768 (18 bit)	
Short 1-2 & 3-4	1280 x 1024 (48 bit)	
Short 5-6	1400 x 1050 (48 bit)	
Short 1-2 & 5-6	1400 x 1050 (36 bit)	
Short 3-4 & 5-6	1600 x 1200 (48 bit)	
Short 1-2, 3-4 & 5-6	1280 x 768 (18 bit)	
Short 7-8	1600 x 1050 (48 bit)	
Short 1-2 & 7-8	1920 x 1200 (36 bit)	
Short 3-4 & 7-8	1024 x 768 (24 bit)	
Short 1-2, 3-4, 5-6 and 7-8	close	

Table 5-5: LVDS Screen Resolution Selection Jumper Settings

The **LVDS Screen Resolution Selection** jumper location is shown in **Figure 5-12**.

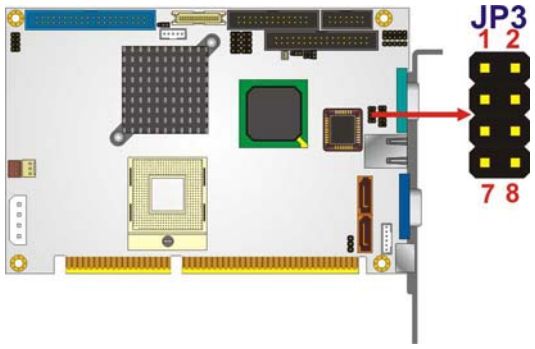

Figure 5-13: LVDS Screen Resolution Selection Jumper Pinout Locations

5.5 Chassis Installation

5.5.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IOWA-8522 must have air vents to allow cool air to move into the system and hot air to move out.

The IOWA-8522 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

NOTE:

IEI has a wide range of backplanes available. Please contact your IOWA-8522 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

5.5.2 Motherboard Installation

To install the IOWA-8522 motherboard into the chassis, please refer to the reference material that came with the chassis.

5.6 Internal Peripheral Device Connections

The cables listed in **Table 5-6** are shipped with the IOWA-8522.

Quantity	Type
1	IDE cable
1	Dual RS-232 cable
1	KB/MS Y cable
2	SATA drive cable

1	SATA drive power cable

Table 5-6: IEI Provided Cables

5.6.1 Audio Kit Installation (Optional)

NOTE:

This is an optional item that must be ordered separately. For further information please contact the nearest IOWA-8522 distributor, reseller or vendor or contact an iEi sales representative directly. Send any queries to sales@iei.com.tw.

The 5.1 channel audio kit connects to the 9-pin audio connector on the IOWA-8522. Jumpers on the audio kit adjust the function of some of the audio jacks. Please refer to the audio kit user's manual for details.

The 5.1 channel audio kit consists of three audio jacks. The microphone audio jack connects to a microphone, the line out audio jack is used for audio output to an external amplifier or speakers and the line in audio jack is for recording from a line audio source.

Step 1: **Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the IOWA-8522. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).

Step 2: **Locate the audio connector**. The location of the 9-pin audio connector is shown in **Chapter 3**.

Step 3: **Align pin 1**. Align pin 1 on the onboard connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot.

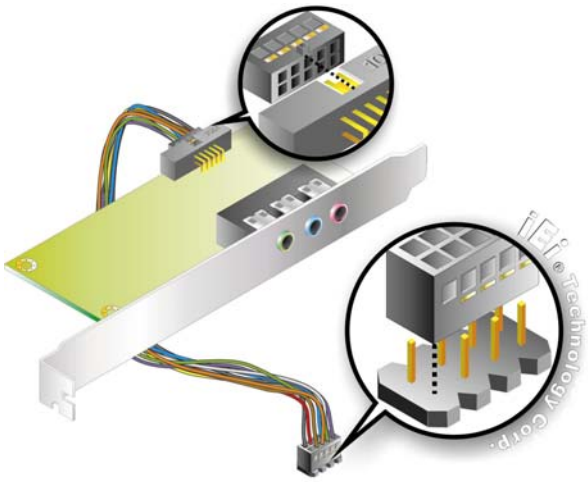

Figure 5-14: Audio Kits

Step 4: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the IOWA-8522, secure the audio kit bracket to the system chassis.

Step 5: **Connect the audio devices**. Please refer to the audio kit user's manual for details.

Step 6: **Install the driver**. Install the ALC655 drivers. Refer to **Chapter 7** for driver installation instructions.

5.6.2 IDE Cable Connection

The IDE cable connects to up to two IDE devices. To connect the IDE devices to the IOWA-8522 please follow the instructions below.

Step 1: **Locate the IDE connector**. The location of the IDE device connector is shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See Figure 5-15. A key on the front of the cable connector ensures it can only be inserted in one direction.

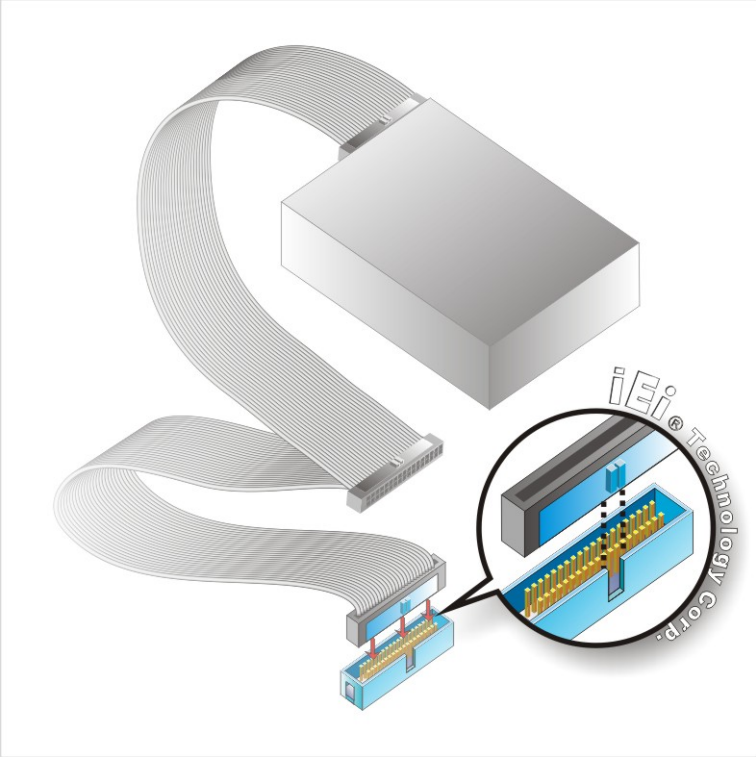

Figure 5-15: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the other side of the cable to the IDE device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.6.3 LVDS LCD Installation

The IOWA-8522 can be connected to a TFT LCD screen through the 30-pin LVDS crimp connector on the board. To connect a TFT LCD to the IOWA-8522, please follow the steps below.

Step 1: **Locate the connector**. The location of the LVDS connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector from the LVDS PCB driving board to the LVDS connector as shown in Figure 5-16. When connecting, make sure the pins are properly aligned.

WARNING:

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

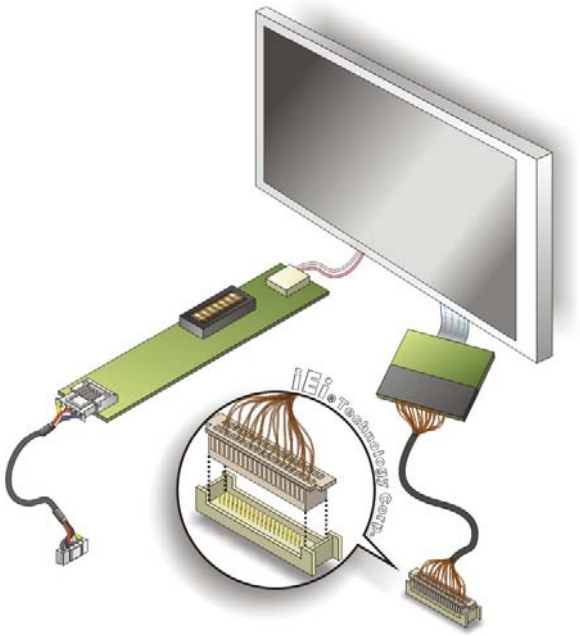

Figure 5-16: LVDS Connector

Step 3: **Locate the backlight inverter connector.** The location of the backlight inverter connector is shown in **Chapter 3**.

Step 4: **Connect the backlight connector**. Connect the backlight connector to the driver LVDS LCD PCB as shown in Figure 5-17. When inserting the cable connector, make sure the pins are properly aligned.

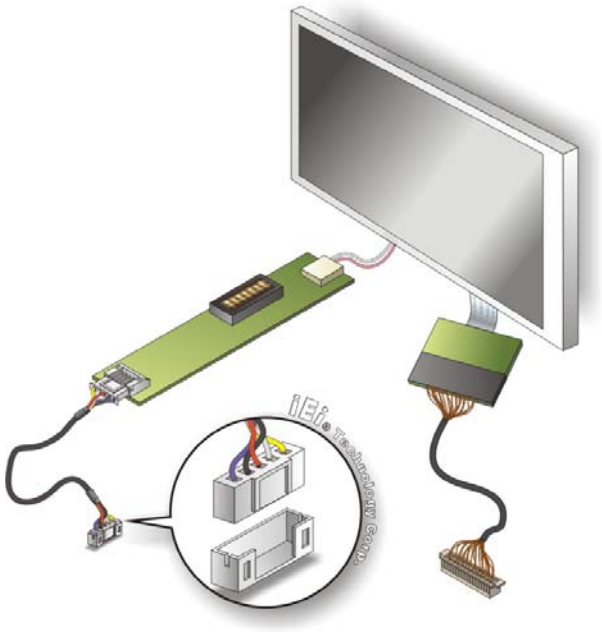

Figure 5-17: Backlight Inverter Connection

5.6.4 Dual RS-232 Cables

The IOWA-8522 is shipped with one dual RS-232 serial port connector cable. The dual serial port connector cable connects the serial port connectors on the cable to the serial port connectors on the IOWA-8522. Follow the steps below to connect the dual serial port connector cable.

Step 1: **Locate the serial port connector**. The location of the serial port connector is shown in **Chapter 3**.

Step 2: **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the IOWA-8522 COM2 serial port connector.

Step 3: **Insert the cable connectors** Once the cable connector is properly aligned with the COM2 serial port connector on the IOWA-8522, connect the cable connector to the onboard connectors. See Figure 5-18.

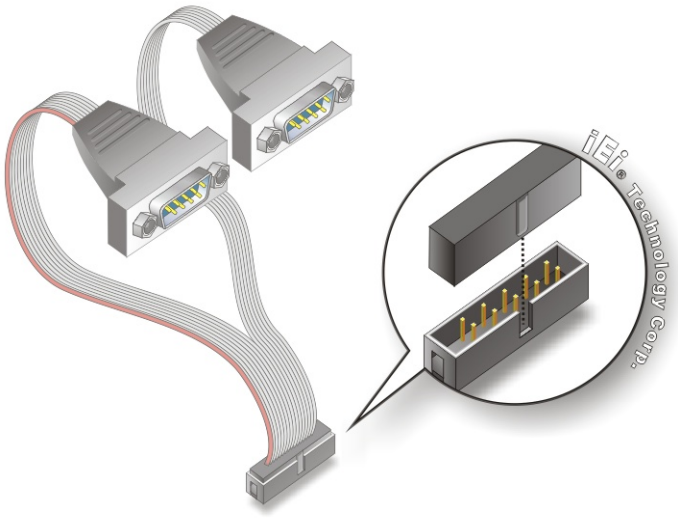

Figure 5-18: Dual Serial Port Connector Cable Connection

Step 4: **Attach DB-9 serial port connectors to the chassis**. The dual DB-9 serial port connectors can be inserted into dual preformed holes in the chassis. Once inserted the DB-9 connectors should be secured to the chassis with retention screws.

5.6.5 SATA Drive Connection

The IOWA-8522 is shipped with SATA drive cables and SATA drive power cable. Follow the steps below to connect the SATA drives to the CPU card.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-19**.

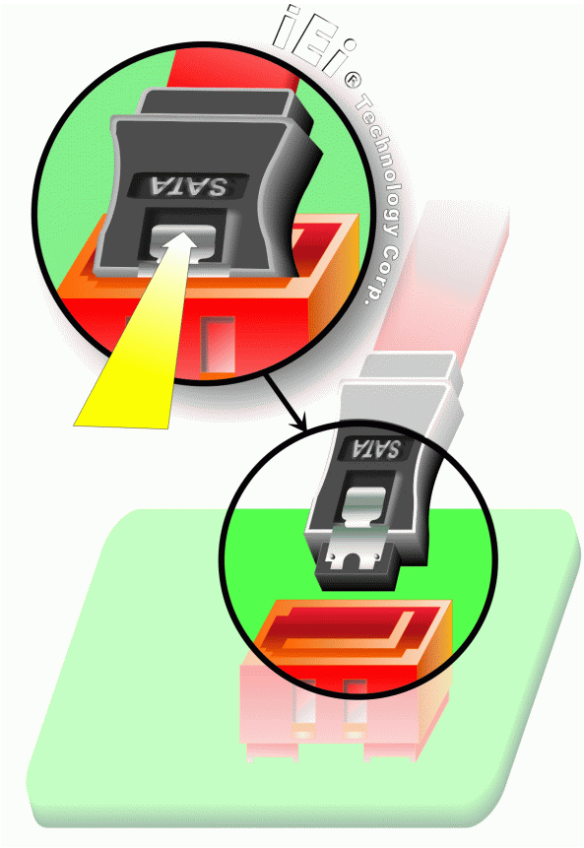

Figure 5-19: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-20**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-20**.

Figure 5-20: SATA Power Drive Connection

5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Mouse and keyboard
- RJ-45 Ethernet cable connectors
- Serial devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IOWA-8522 external peripheral interface connector making sure the pins are properly aligned.

5.7.1 PS/2 Y-Cable Connection

The IOWA-8522 has a PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is connected to the PS/2 Y-cable that came with the IOWA-8522.

One of the PS/2 cables is connected to a keyboard and the other to a mouse. Follow the steps below to connect a keyboard and mouse to the IOWA-8522.

Step 1: **Locate the dual PS/2 connector**. The location of the PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert the PS/2 connector on the end of the PS/2 y-cable into the external PS/2 connector. See **Figure 5-21**.

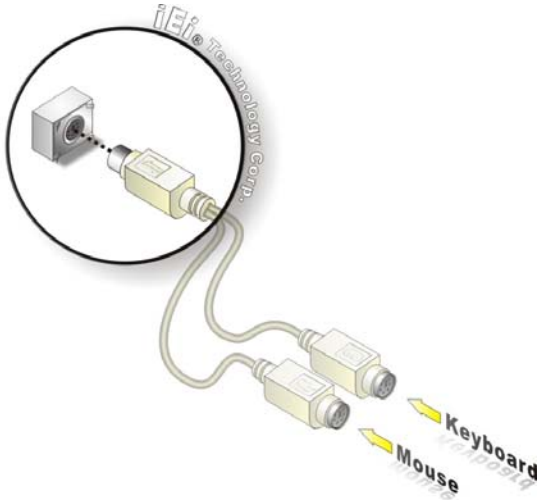

Figure 5-21: PS/2 Keyboard/Mouse Connector

Step 3: **Connect the keyboard and mouse**. Connect the keyboard and mouse to the appropriate connector. The keyboard and mouse connectors can be distinguished from each other by looking at the small graphic at the top of the connector.

5.7.2 RJ-45 Ethernet Connection

The IOWA-8522 RJ-45 Ethernet connector on the external peripheral interface panel is connected to a LAN cable RJ-45 connector (**Figure 5-22**).

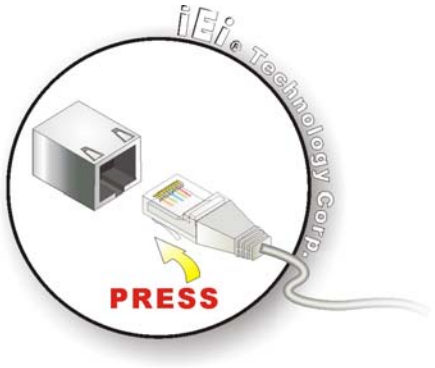

Figure 5-22: RJ-45 Connector

5.7.3 Serial Device Connection

The IOWA-8522 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IOWA-8522.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-23.

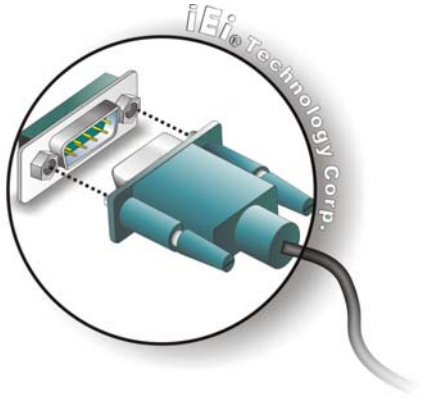

Figure 5-23: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.7.4 VGA Monitor Connection

The IOWA-8522 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IOWA-8522, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the IOWA-8522. See **Figure 5-24**.

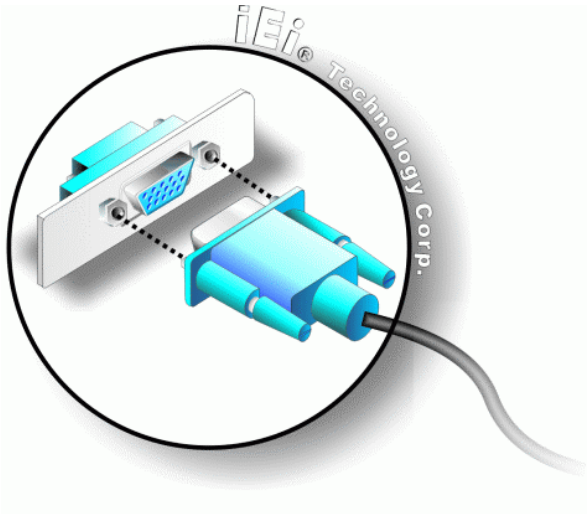

Figure 5-24: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

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Chapter

6

AMI BIOS

6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the DELETE key is pressed, restart the computer and try again.

6.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, use the PageUp and PageDown keys to change entries, press F1 for help and press ESC to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

When F1 is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press ESC or the F1 key again.

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Section 5.4**.

6.1.5 BIOS Menu Bar

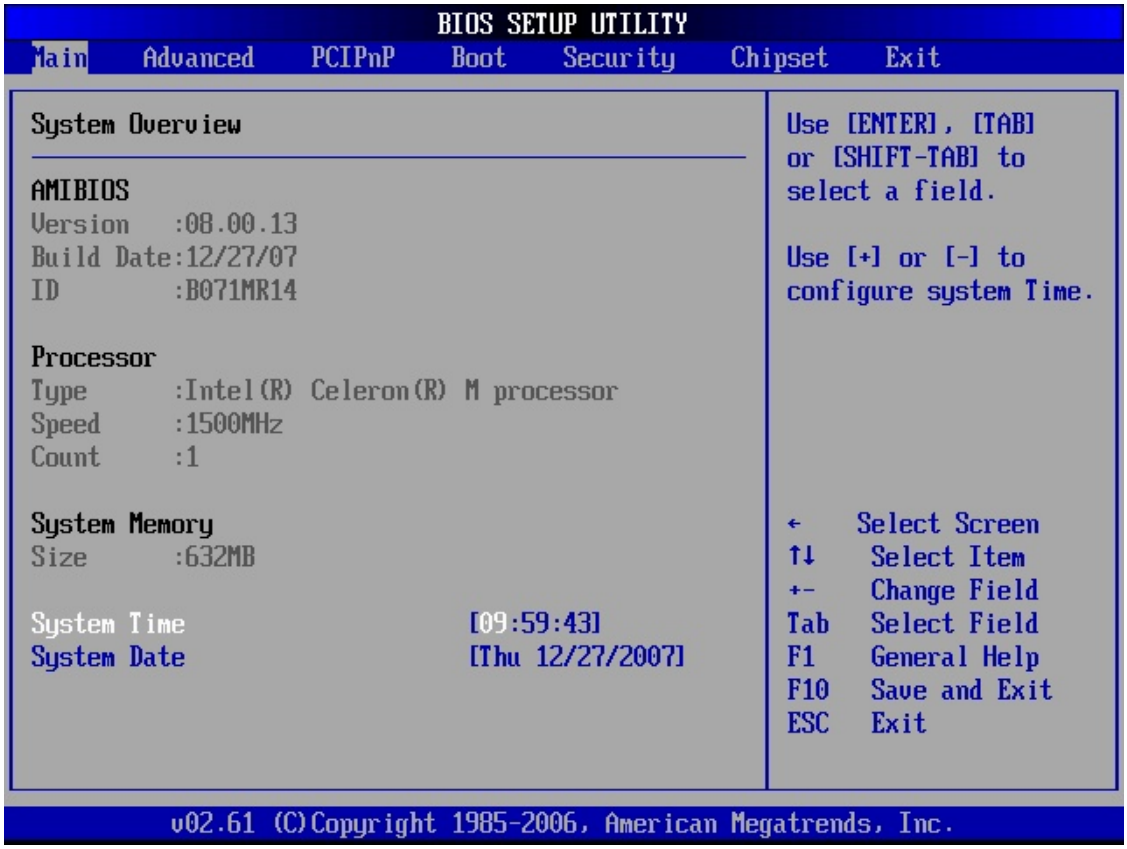
The menu bar on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes the power settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

6.2 Main

The Main BIOS menu (**BIOS Menu 1**) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ **System Overview**

The System Overview lists a brief summary of different system components. The fields in System Overview cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications

- **Type**: Names the currently installed processor
- **Speed**: Lists the processor speed
- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the System Time option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

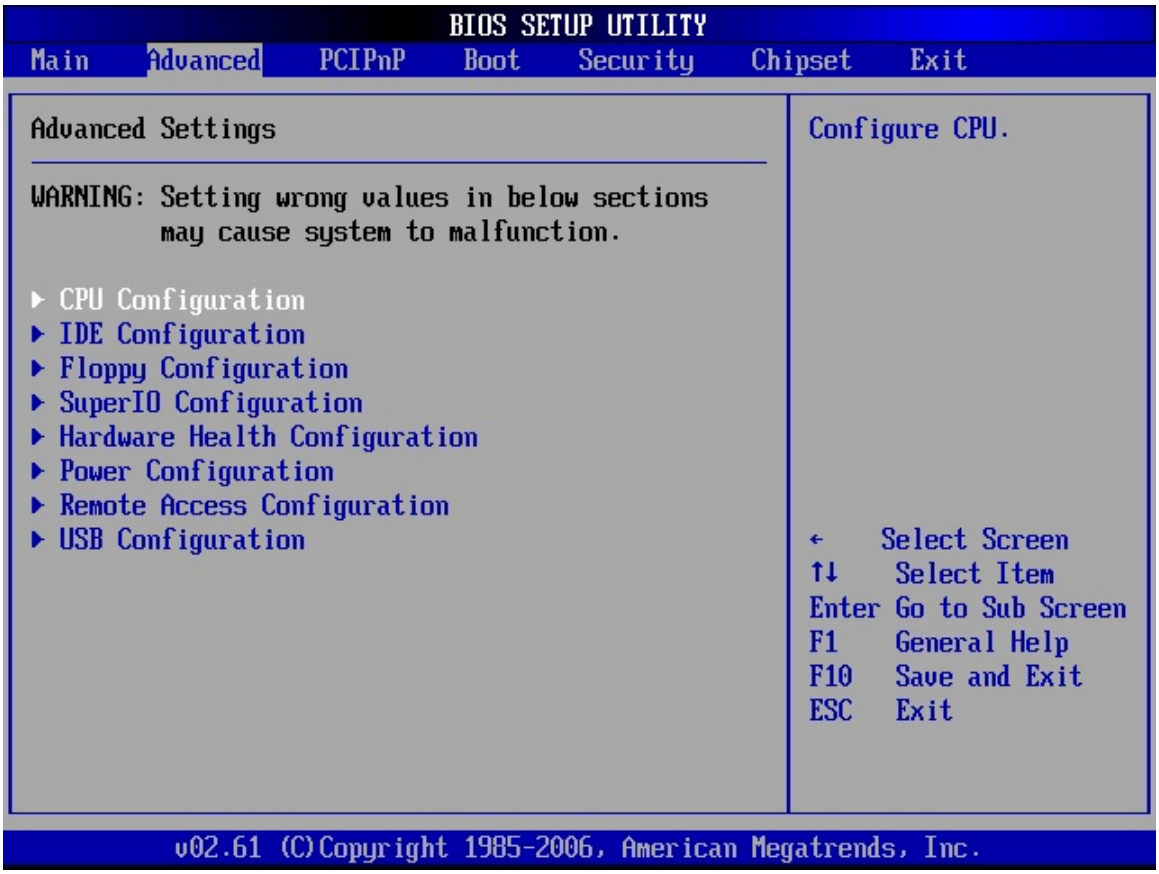
Use the System Date option to set the system date. Manually enter the day, month and year.

6.3 Advanced

Use the Advanced menu (BIOS Menu 2) to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

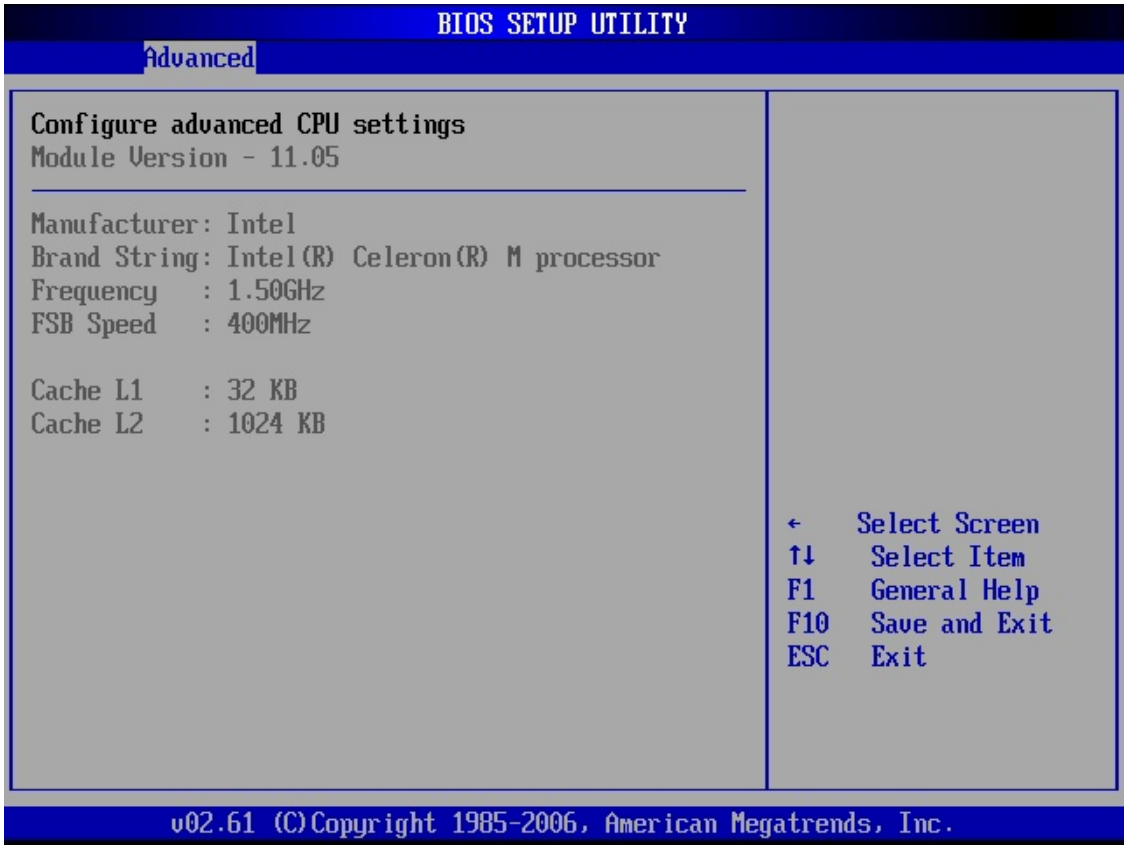
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

Use the CPU Configuration menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.



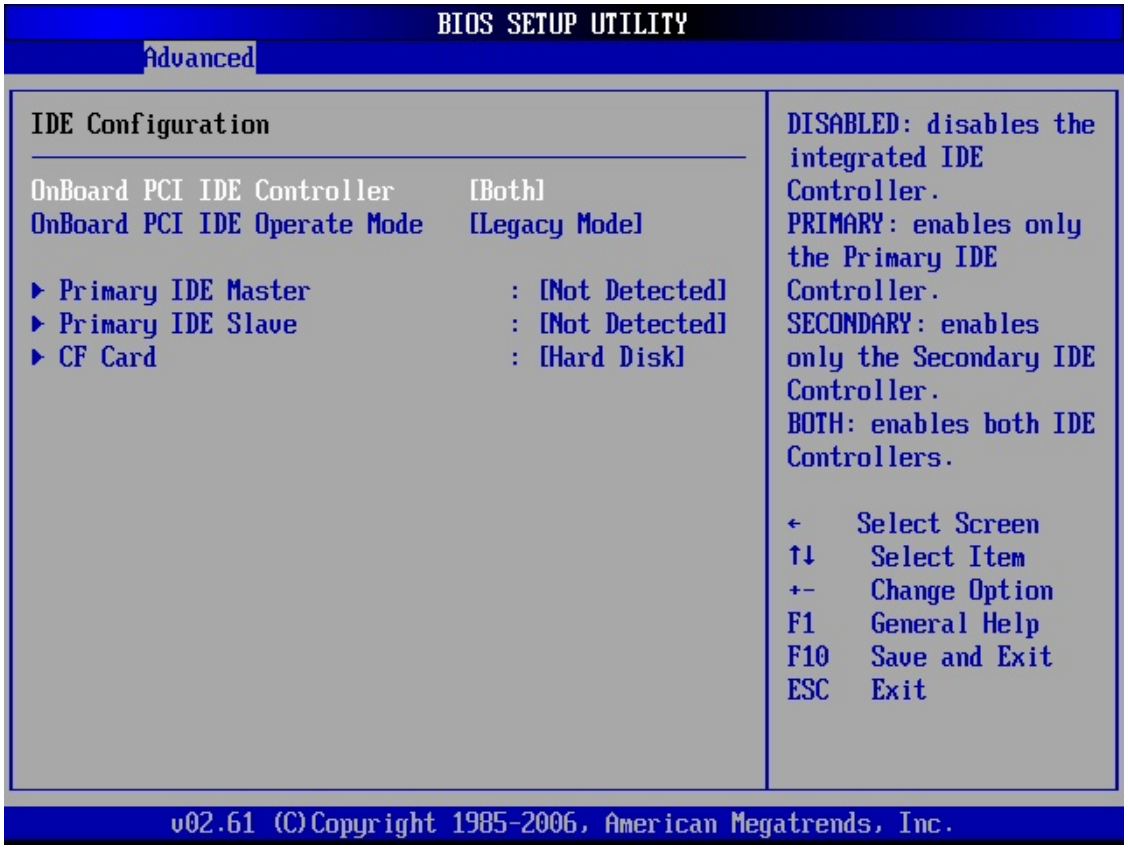
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Module Version**: xx.xx
- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Ratio Actual Value**: Displays the ratio at which the CPU is actually operating

6.3.2 IDE Configuration

Use the IDE Configuration menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Both]
OnBoard PCI IDE Operate Mode [Legacy Mode]
▶ Primary IDE Master : [Not Detected]
▶ Primary IDE Slave : [Not Detected]
▶ CF Card : [Hard Disk]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 4: IDE Configuration

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

➔ **Legacy IDE Channels [PATA Pri, SATA Sec]**

Use the **Legacy IDE Channels** option to determine how SATA channels and PATA channels are ordered.

➔ **SATA Only** Enables SATA channels only.

➔ **PATA Pri, SATA Sec** **DEFAULT** Puts SATA channels behind PATA channels.

➔ **SATA Pri, PATA sec** Puts SATA channels before PATA channels.

➔ **PATA Only** Enables PATA channels only.

➔ **IDE Master and IDE Slave**

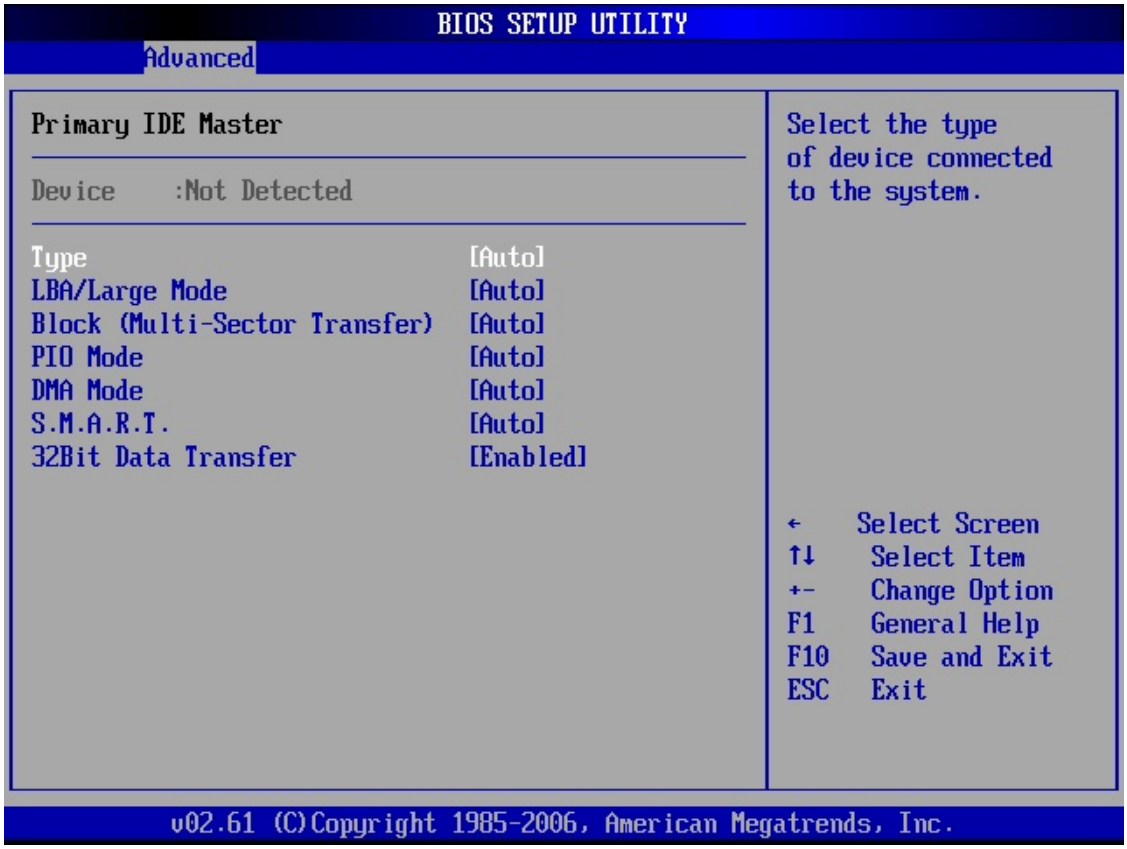
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

The IDE Configuration menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

Use the IDE Master and IDE Slave configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.

- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Adjust the DMA mode options.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the Type BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ➔ **ZIP** ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the LBA/Large Mode option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the Block (Multi Sector Transfer) to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the PIO Mode option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk

drive support cannot be determined.

- ➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps
- ➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps
- ➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps
- ➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps
- ➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the DMA Mode BIOS selection to adjust the DMA mode options.

- ➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
- ➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
- ➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
- ➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
- ➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
- ➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
- ➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data

transfer rate of 16.6MBps

- ➔ **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
- ➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
- ➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- ➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the S.M.A.R.T option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. S.M.A.R.T predicts impending drive failures. The S.M.A.R.T BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

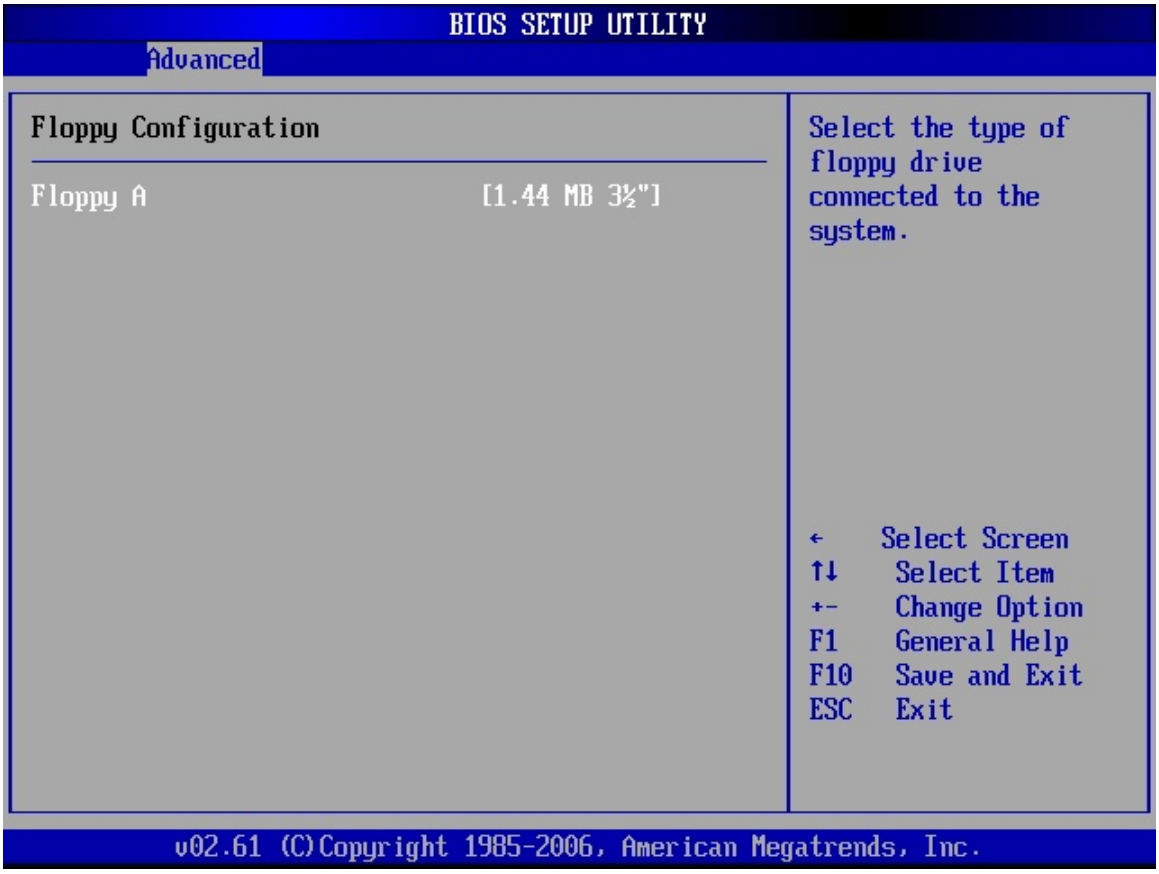
Use the 32Bit Data Transfer BIOS option to enables or disables 32-bit data transfers.

➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.

6.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.



BIOS Menu 6: IDE Master and IDE Slave Configuration

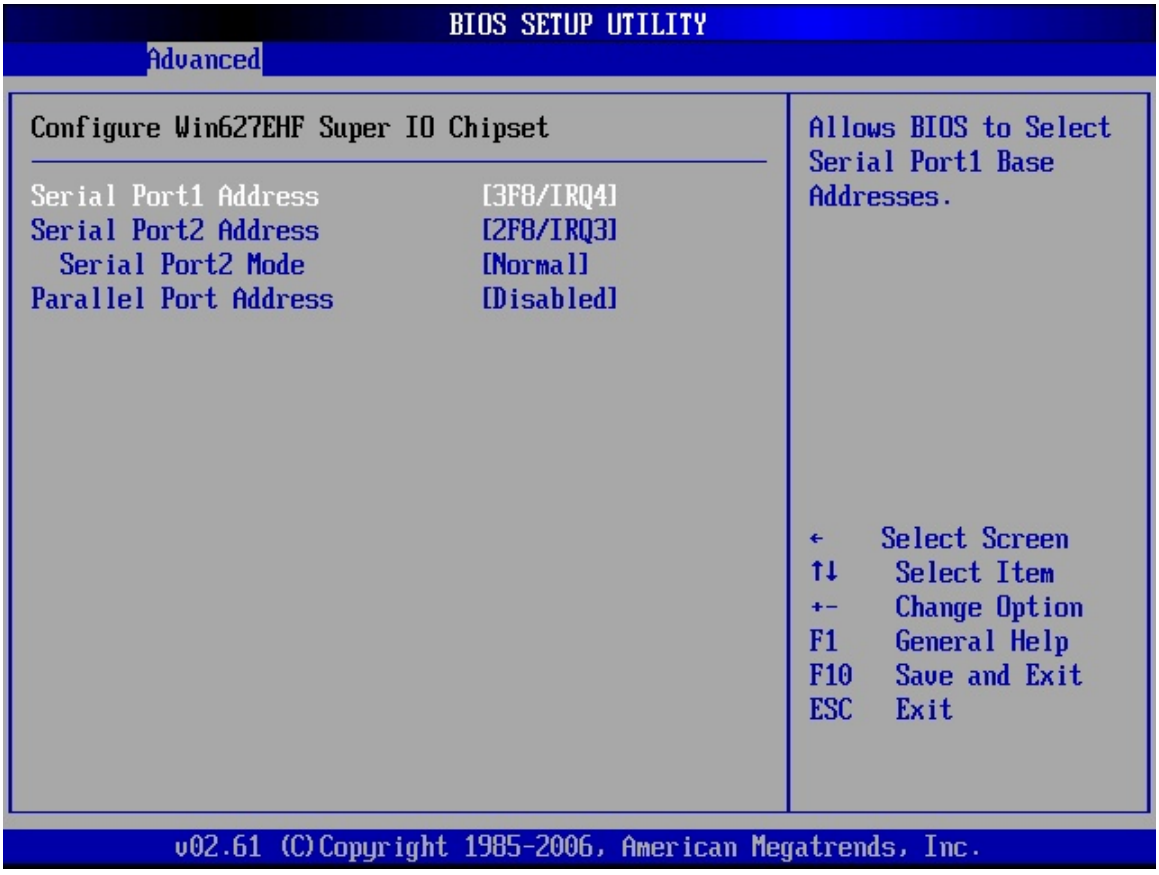
➔ **Floppy A/B**

Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2’
- 2.88 MB 31/2”

6.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 7: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA

➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **IR Duplex Mode [Half Duplex]**

Use the **IR Duplex Mode** option to select the serial port 2 duplex communication method.

➔ **Half Duplex** **DEFAULT** Communications are allowed in one direction at a time.

➔ **Full Duplex** Communications are allowed in both directions simultaneously.

➔ **Parallel Port Address [Disabled]**

Use the **Parallel Port Address** option to select the parallel port base address.

➔ **Disabled** No base address is assigned to the Parallel Port

➔ **378** **DEFAULT** Parallel Port I/O port address is 378

➔ **278** Parallel Port I/O port address is 278

➔ **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.

➔ **Bi-directional** Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.

➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-

directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.

➔ **ECP+EPP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

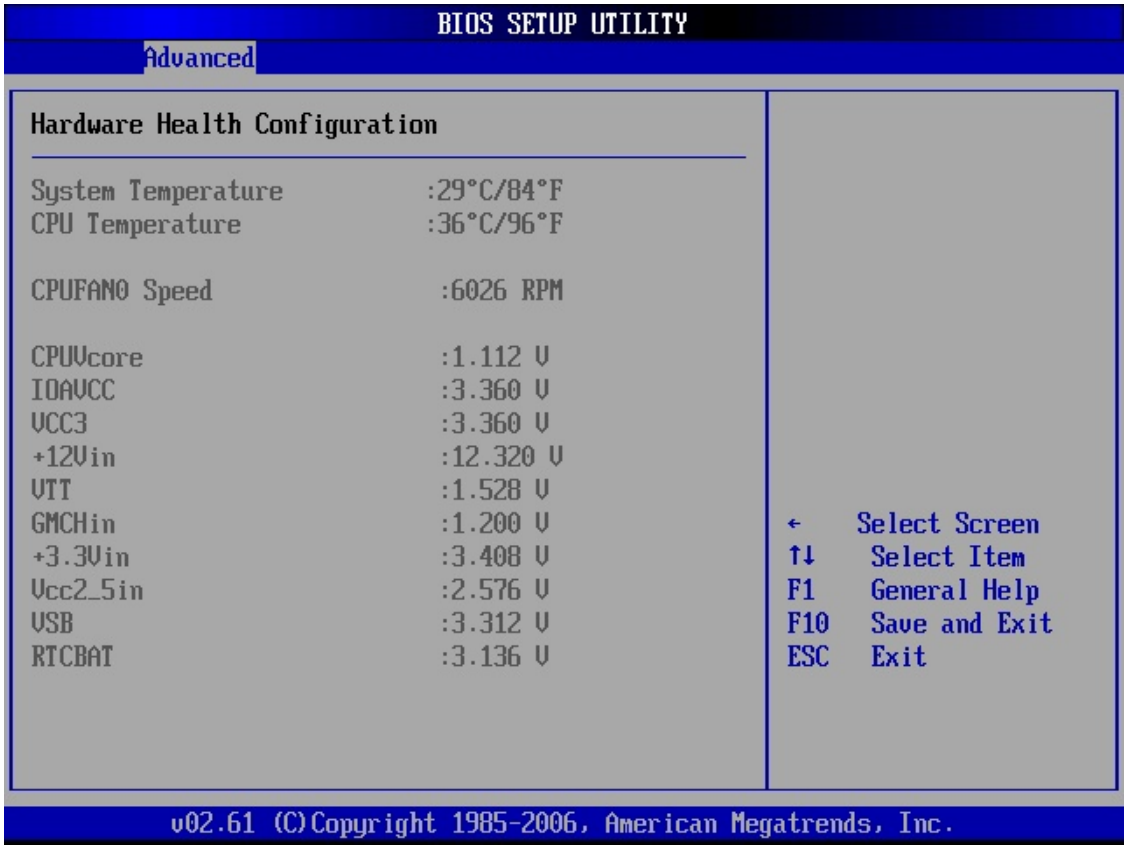
Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

6.3.5 Hardware Health Configuration

The Hardware Health Configuration menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 8: Hardware Health Configuration

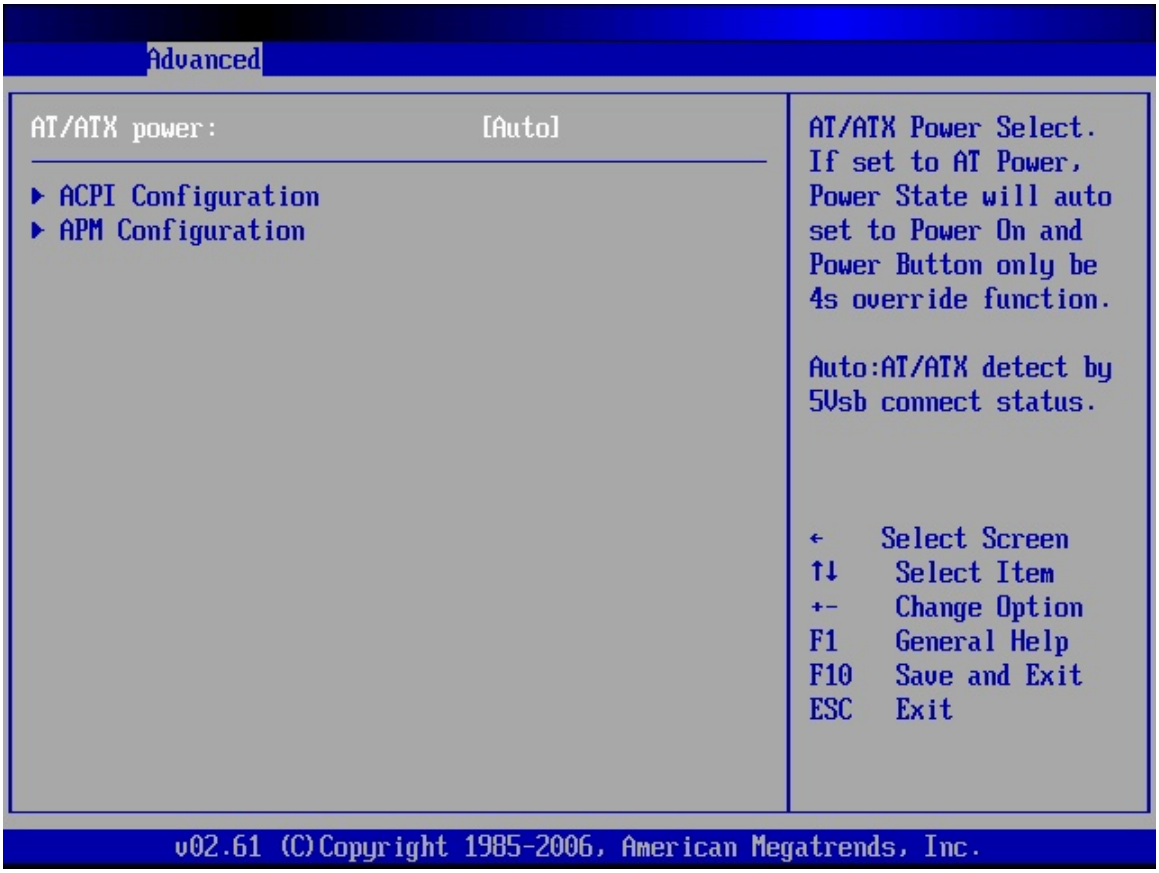
The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - System Temperature
  - CPU Temperature
- **Fan Speed**: The following system fans speeds are monitored
  - CPU Fan
- **Voltages**: The following system voltages are monitored
  - CPUVcore

- IOAVCC
- VCC3
- +12Vin
- VTT
- GMCHin
- +3.3Vin
- VCC2_5in
- VSB
- RTCBAT

6.3.6 Power

The **Power** menu (Error! Reference source not found.) allows the advanced power management options to be configured.



BIOS Menu 9:Power

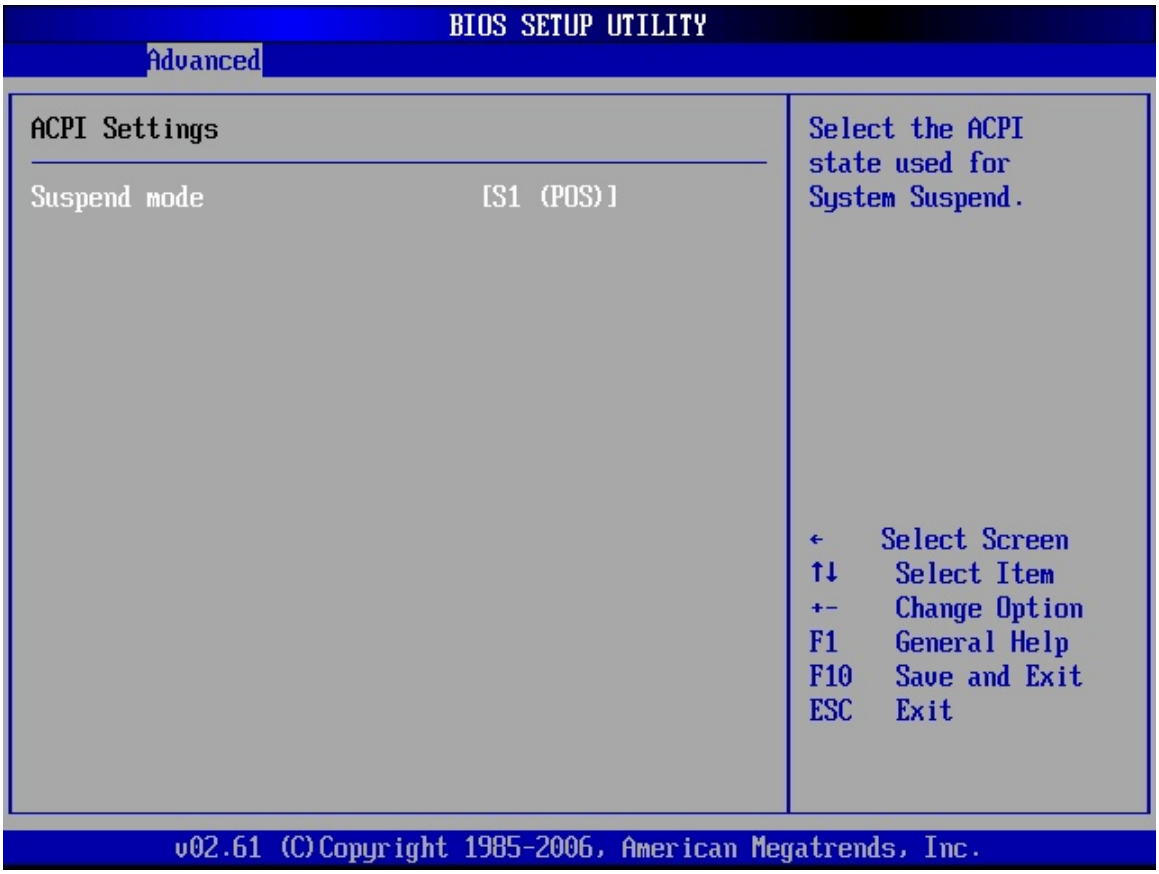
➔ **AT/ATX Power [Auto]**

Use the **AT/ATX Power** BIOS option to enable access to certain advanced power management features.

➔ **Auto**	**DEFAULT**	Automatically detects which type of power source is in use.
➔ **AT**		Disables the APM features
➔ **ATX**		Enables the APM features

6.3.6.1 ACPI Configuration

The **ACPI Configuration** menu (Error! Reference source not found.) has no configurable options.



BIOS Menu 10: ACPI Settings

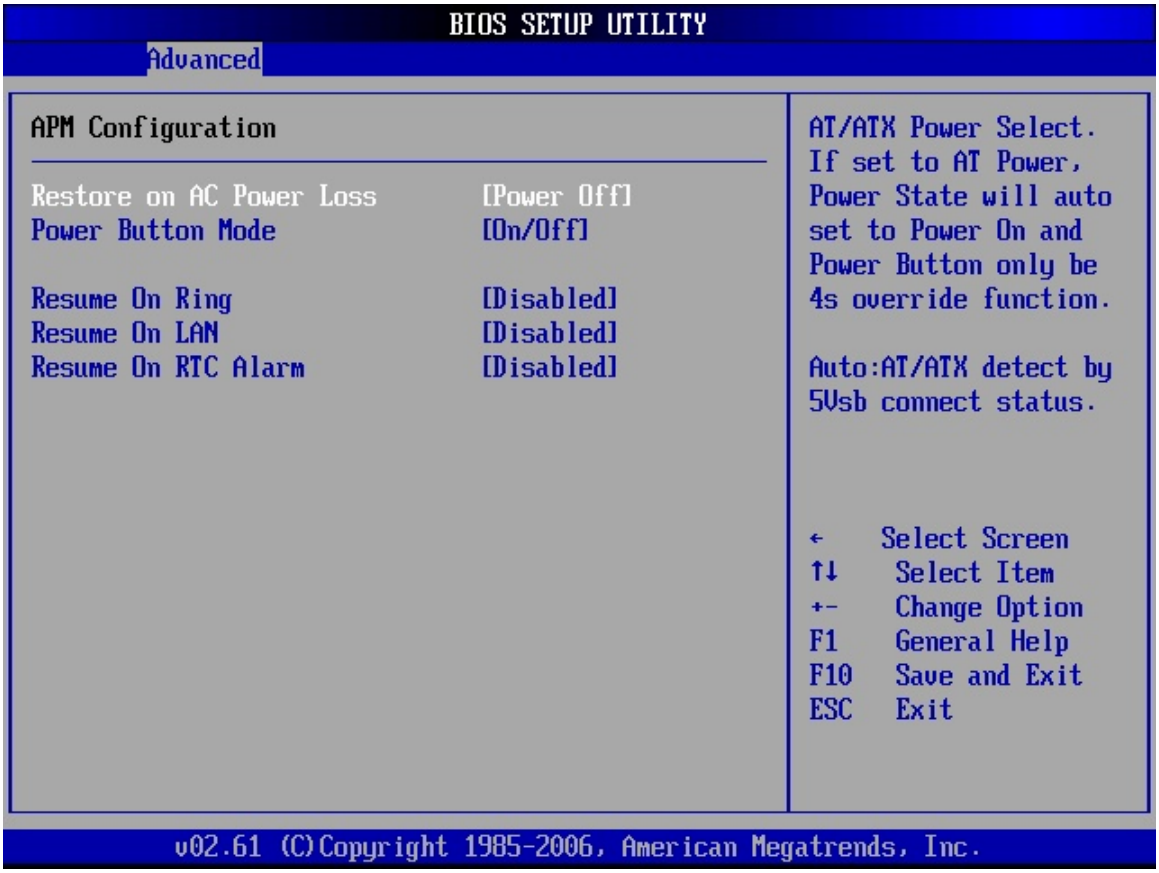
➔ **Suspend Mode [S1(POS)]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS) DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

6.3.6.2 APM Configuration

The **Power** menu (**BIOS Menu 11**) allows the advanced power management options to be configured.


BIOS SETUP UTILITY
Advanced
APM Configuration
Restore on AC Power Loss [Power Off]
Power Button Mode [On/Off]
Resume On Ring [Disabled]
Resume On LAN [Disabled]
Resume On RTC Alarm [Disabled]
AT/ATX Power Select. If set to AT Power, Power State will auto set to Power On and Power Button only be 4s override function.
Auto:AT/ATX detect by 5Vsb connect status.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 11: APM Configuration

➔ **Restore on AC Power Loss [Power On]**

Use the **Restore on AC Power Loss** BIOS to specify what state the system will return to after a power loss.

➔ **Power Off**	**DEFAULT**	The system will stay off
➔ **Power On**		The system will power on
➔ **Last State**		The system will return to the same state as before power was lost

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off**	**DEFAULT**	When the power button is pressed the system is either turned on or off
➔ **Suspend**		When the power button is pressed the system goes into suspend mode

➔ **Resume on Ring [Disabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled**	**DEFAULT**	Wake event not generated by an incoming call
➔ **Enabled**		Wake event generated by an incoming call

➔ **Resume on LAN [Disabled]**

The **Resume on LAN** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the LAN.

➔ **Disabled** **DEFAULT** Wake event not generated by LAN activity

➔ **Enabled** Wake event generated by LAN activity

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

➔ **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event

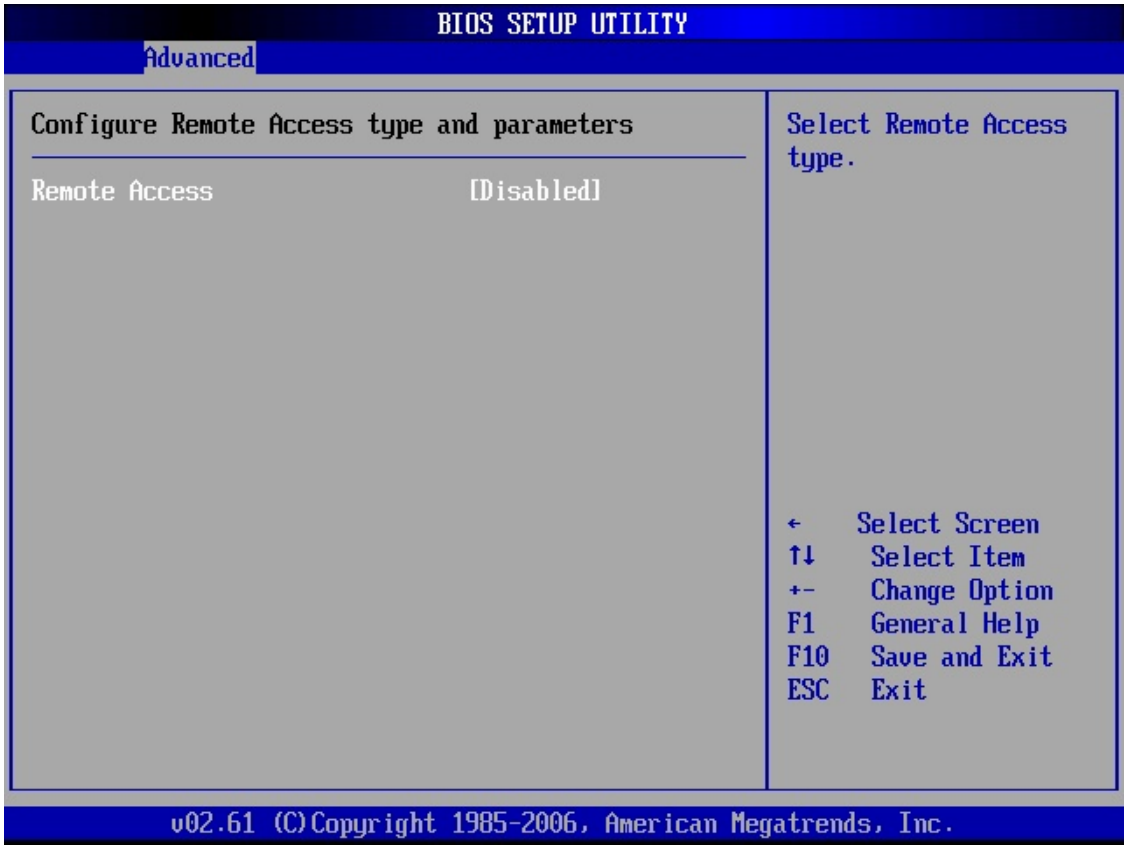
➔ **Enabled** If selected, the following appears with values that can be selected:

- RTC Alarm Date (Days)
- System Time

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

6.3.7 Remote Access Configuration

Use the Remote Access Configuration menu (**BIOS Menu 12**) to configure remote access parameters. The Remote Access Configuration is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.



BIOS Menu 12: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**	**DEFAULT**	Remote access is disabled.
➔ **Enabled**		Remote access configuration options shown below appear:

- Serial Port Number
- Serial Port Mode
- Redirection after BIOS POST
- Terminal Type

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option to select the serial port used for remote access.

➔ **COM1** **DEFAULT** System is remotely accessed through COM1

➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option is listed only, and is adjusted in 6.3.3

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)
➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader

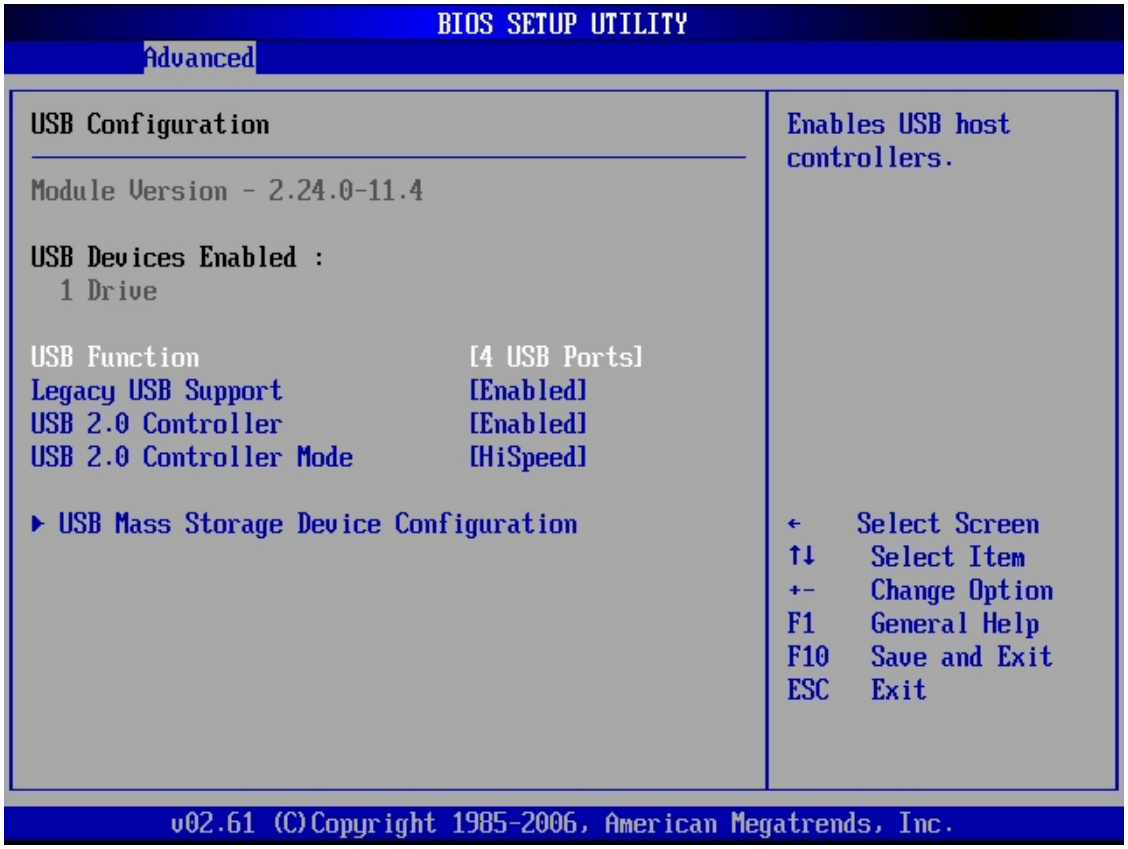
➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

6.3.8 USB Configuration

Use the USB Configuration menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.



BIOS Menu 13: USB Configuration

➔ **USB Configuration**

The USB Configuration field shows the system USB configuration. The items listed are:

- Module Version: x.xx.x-xx.x

➔ **USB Function [4 USB Ports]**

Use the USB Function BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining two USB frees up system resources that can be redirected elsewhere.

- ➔ **Disabled** USB function support disabled
- ➔ **2 USB Ports** Two USB ports are enabled
- ➔ **4 USB Ports** **DEFAULT** Four USB ports are enabled

➔ **Legacy USB Support [Enabled]**

Use the Legacy USB Support BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

- ➔ **Disabled** Legacy USB support disabled
- ➔ **Enabled** **DEFAULT** Legacy USB support enabled
- ➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **USB 2.0 Controller [Enabled]**

Use the USB 2.0 Controller BIOS option to enable or disable the USB 2.0 controller

- ➔ **Disabled** USB 2.0 controller disabled
- ➔ **Enabled** **DEFAULT** USB 2.0 controller enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

The **USB 2.0 Controller Mode** BIOS option sets the speed of the USB 2.0 controller.

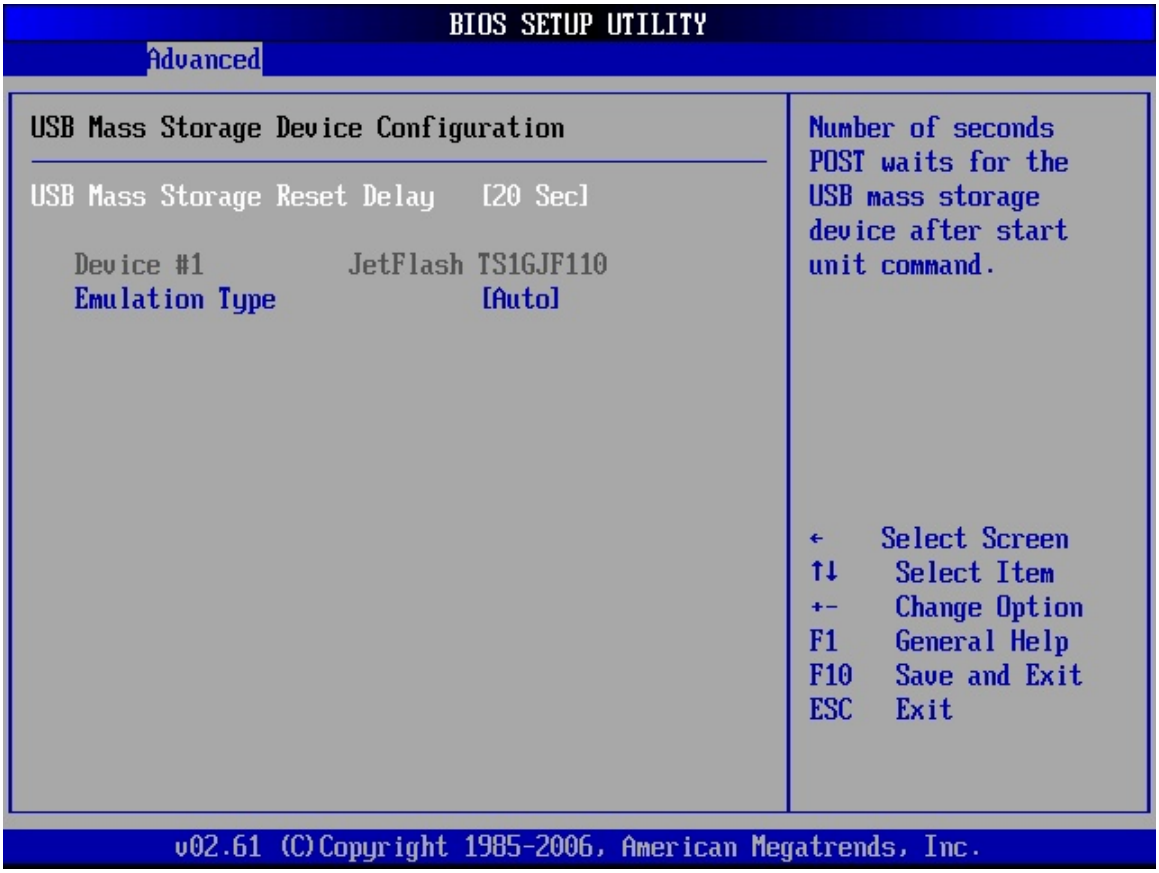
- ➔ **FullSpeed** The controller is capable of operating at full speed

(12Mbits/second)

➔ **HiSpeed** **DEFAULT** The controller is capable of operating at high speed (480Mbits/second)

6.3.8.1 USB Mass Storage Device Configuration

Use the **USB Mass Storage Device Configuration** menu (Error! Reference source not found.) to configure USB mass storage class devices.


BIOS SETUP UTILITY
Advanced
USB Mass Storage Device Configuration
USB Mass Storage Reset Delay [20 Sec]
Device #1 JetFlash TS1GJF110
Emulation Type [Auto]
Number of seconds POST waits for the USB mass storage device after start unit command.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 14: USB Mass Storage Device Configuration

➔ **USB Mass Storage Reset Delay [20 Sec]**

Use the **USB Mass Storage Reset Delay** option to set the number of seconds POST waits for the USB mass storage device after the start unit command.

➔	**10 Sec**		POST waits 10 seconds for the USB mass storage device after the start unit command.
➔	**20 Sec**	**DEFAULT**	POST waits 20 seconds for the USB mass storage device after the start unit command.
➔	**30 Sec**		POST waits 30 seconds for the USB mass storage device after the start unit command.
➔	**40 Sec**		POST waits 40 seconds for the USB mass storage device after the start unit command.

➔ **Device ##**

The **Device##** field lists the USB devices that are connected to the system.

➔ **Emulation Type [Auto]**

Use the **Emulation Type** BIOS option to specify the type of emulation BIOS has to provide for the USB device.

NOTE:

Please note that the device's formatted type and the emulation type provided by the BIOS must match for a device to boot properly. If both types do not match then device's behavior is undefined. To make sure both types match, format the device using BIOS INT13h calls after selecting the proper emulation option in BIOS setup. The FORMAT utility provided by Microsoft® MS-DOS®, Microsoft® Windows® 95, and Microsoft® Windows® 98 can be used for this purpose.

➔	**Auto**	**DEFAULT**	BIOS auto-detects the current USB.
➔	**Floppy**		The USB device will be emulated as a floppy drive.

The device can be either A: or B: responding to INT13h calls that return DL = 0 or DL = 1 respectively.

➔ **Forced FDD** Allows a hard disk image to be connected as a floppy image. This option works only for drives formatted with FAT12, FAT16 or FAT32.

➔ **Hard Disk** Allows the USB device to be emulated as hard disk responding to INT13h calls that return DL values of 80h or above.

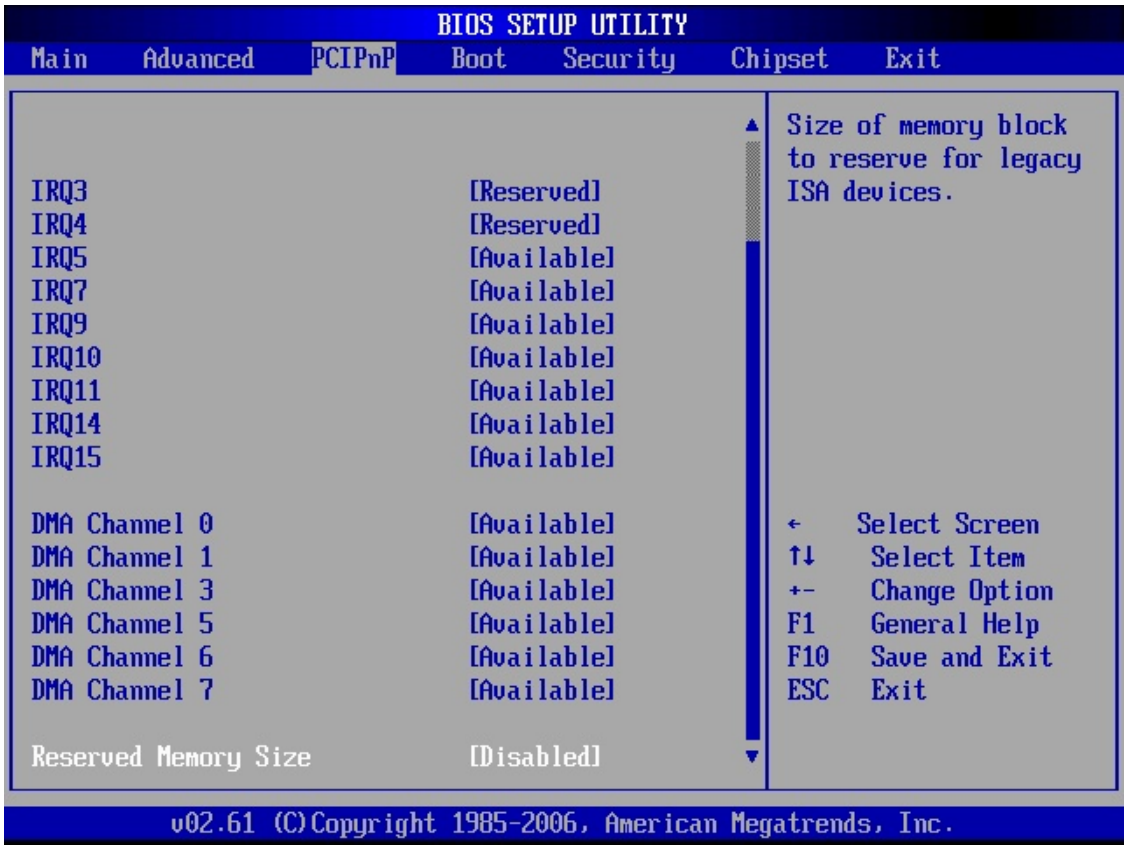
➔ **CDROM** Assumes the CD-ROM is formatted as bootable media. All the devices that support block sizes greater than 512 bytes can only be booted using this option.

6.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 15: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the IRQ# address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3 - **Reserved**
- IRQ4 - **Reserved**

- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the DMA Channel# option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available** **DEFAULT** The specified DMA is available to be used by PCI/PnP devices

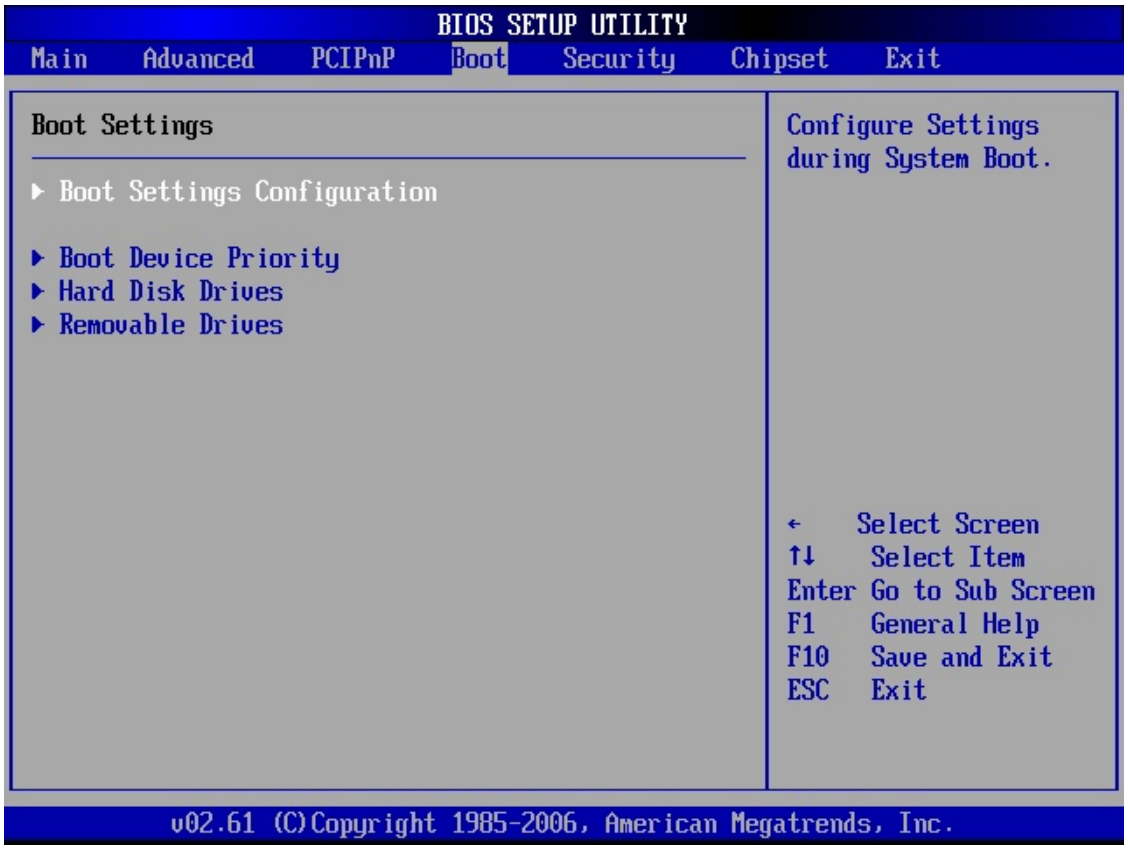
➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

6.5 Boot

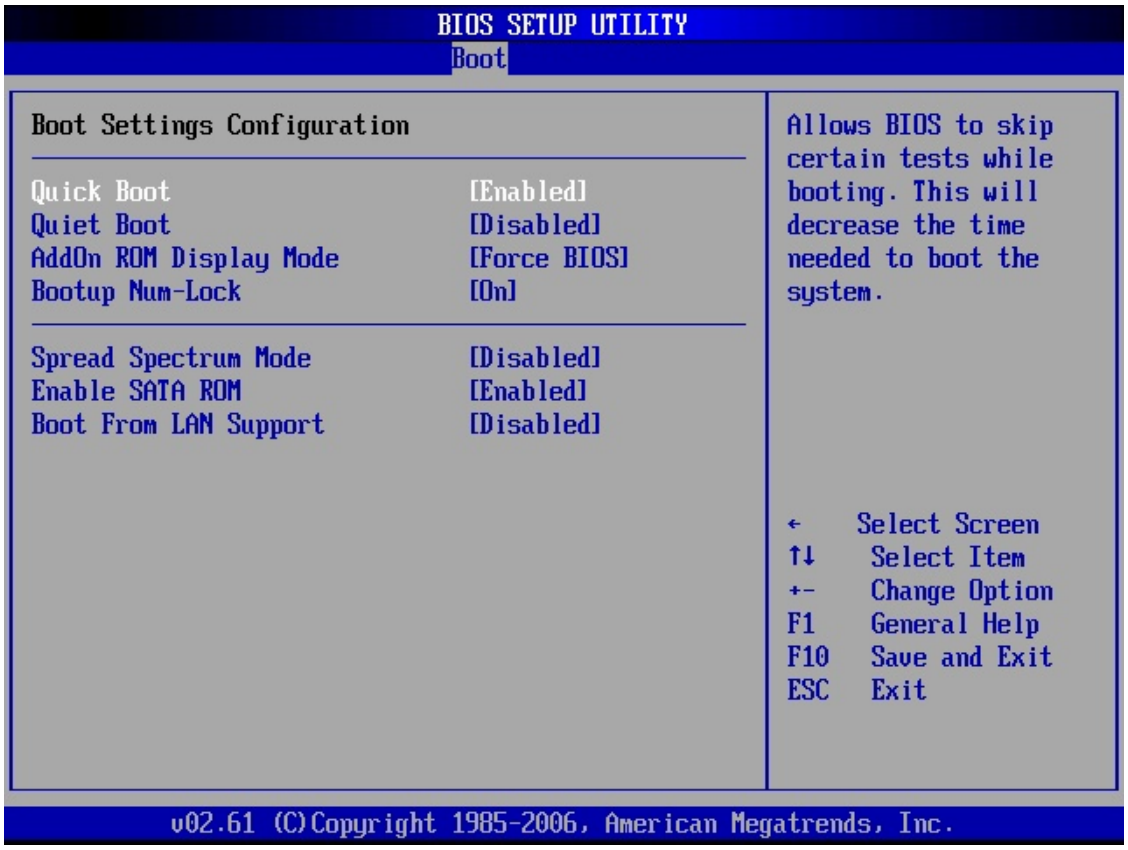
Use the Boot menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 17**) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Spread Spectrum Mode [Disabled]
Enable SATA ROM [Enabled]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the Quick Boot BIOS option to make the computer speed up the boot process.

➔ **Disabled** No POST procedures are skipped

➔ **Enabled** **DEFAULT** Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the Quiet Boot BIOS option to select the screen display when the system boots.

➔ **Disabled** **DEFAULT** Normal POST messages displayed

➔ **Enabled** OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the AddOn ROM Display Mode option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** **DEFAULT** The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the Bootup Num-Lock BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** **DEFAULT** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **Spread Spectrum Mode [Disabled]**

Use the **Spread Spectrum Mode** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse

spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled**	**DEFAULT**	EMI not reduced
➔ **Enabled**		EMI reduced

➔ **Enable SATA ROM [Enabled]**

The **Enable SATA ROM** option enables the booting and configuring of SATA devices.

➔ **Disabled**		SATA devices are disabled
➔ **Enabled**	**DEFAULT**	SATA devices are enabled

➔ **Boot From LAN support [Disabled]**

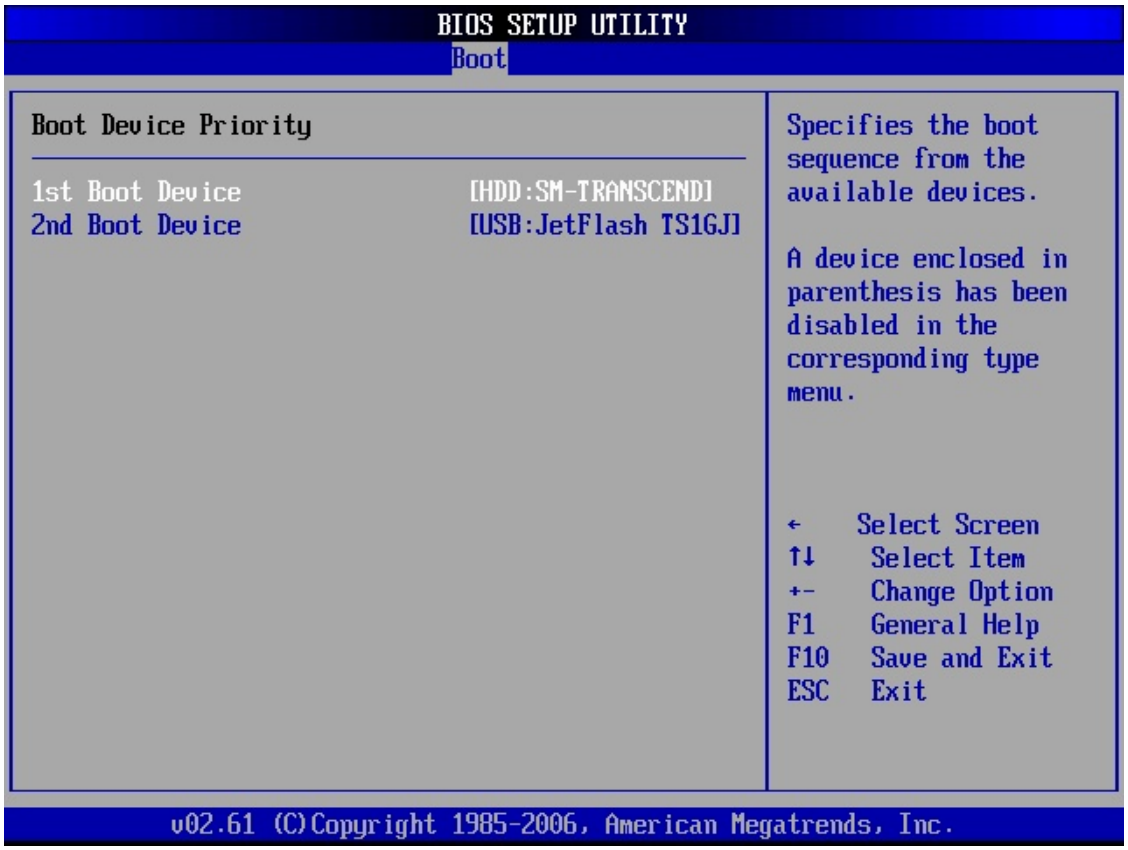
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

➔ **Disabled**	**DEFAULT**	Cannot be booted from a remote system through the LAN
➔ **Enabled**		Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the Boot Device Priority menu (**BIOS Menu 18**) to specify the boot sequence from the available devices. Possible boot devices may include:

- Floppy Drive
- Hard drive
- CD/DVD
- CompactFlash® disk
- USB devices


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [HDD:SM-TRANSCEND]
2nd Boot Device [USB:JetFlash TS1GJ]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 18: Boot Device Priority Settings

6.5.3 Hard Disk Drives, Removable Drives and CD/DVD Drives

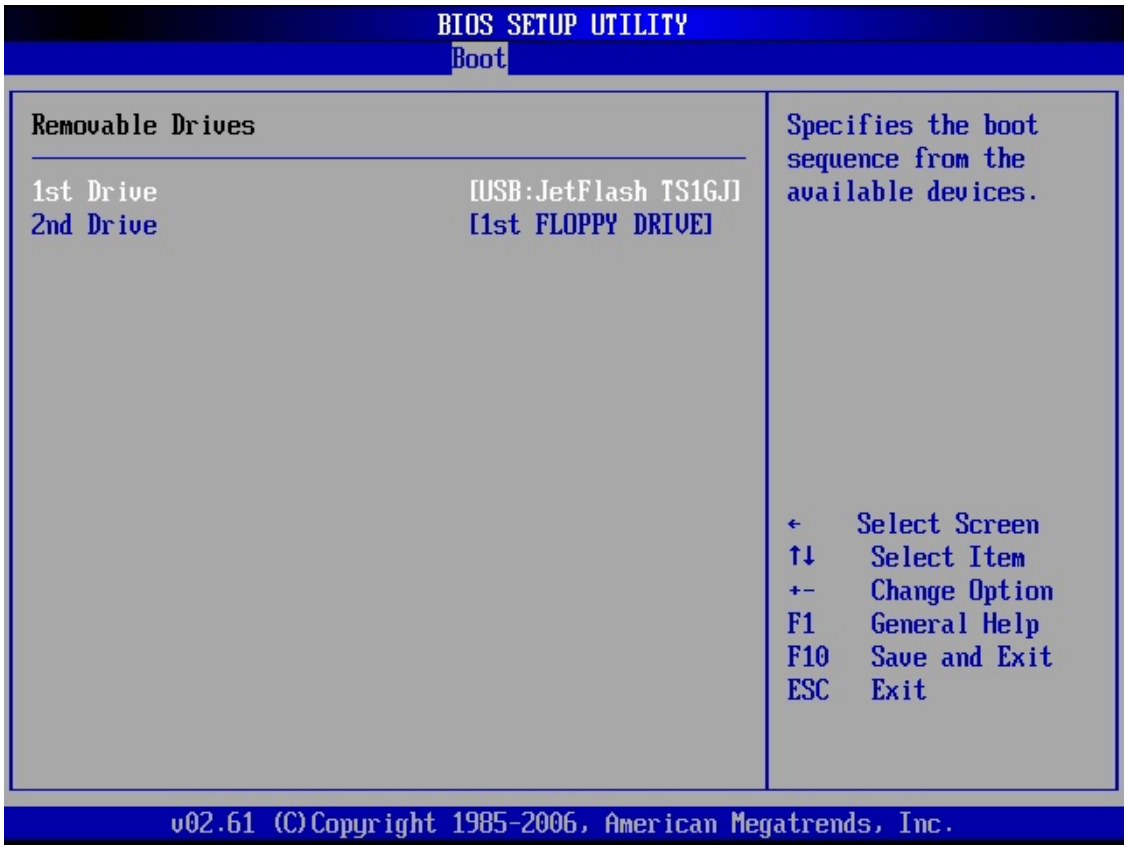
Use these menus (**BIOS Menu 19**) to view the devices connected to the system.

- 1st Drive [1st drive]
- 2nd Drive [2nd drive]

NOTE:

Only the drives connected to the system are shown. For example, if only one removable drive is connected only "**1st Drive**" is listed. If there are no Hard Disk Drives, then there will be no menu for them.

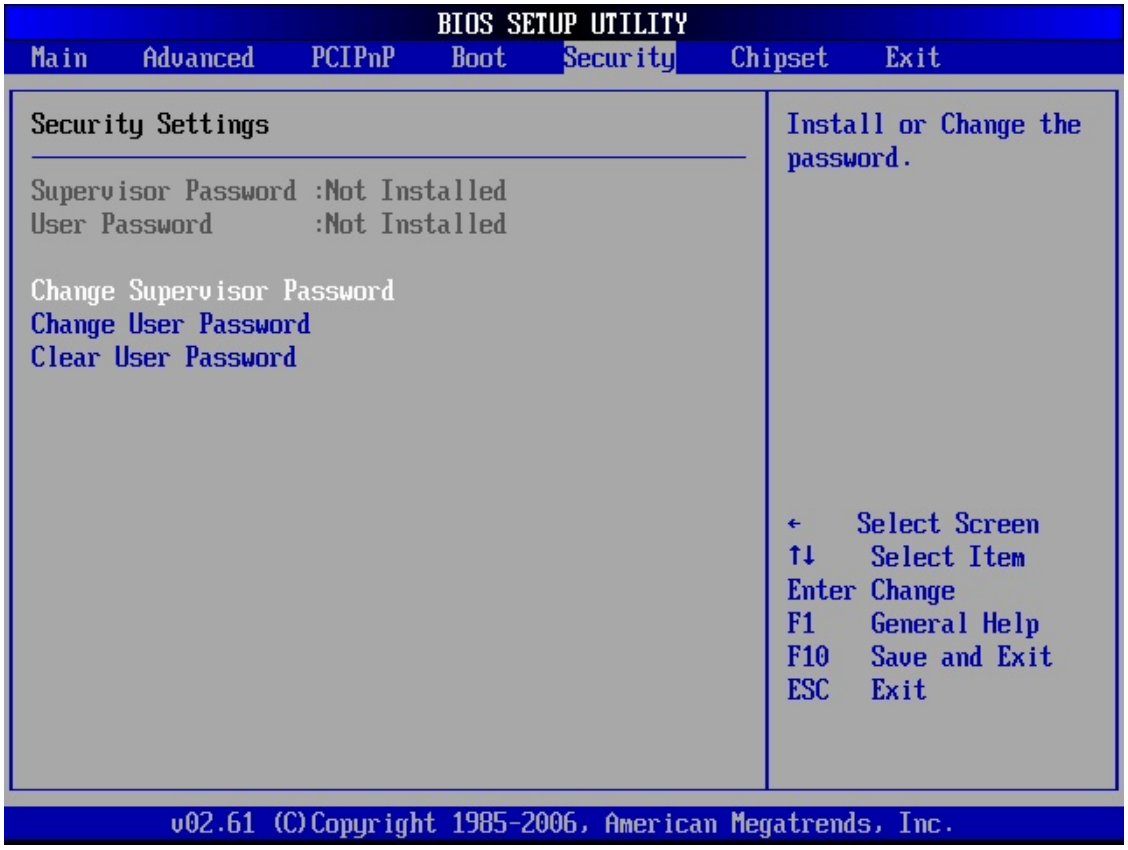
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 19: Removable Drives

6.6 Security

Use the Security menu (**BIOS Menu 20**) to set system and user passwords.



BIOS Menu 20: Security

➔ **Change Supervisor Password**

Use the Change Supervisor Password to set or change a supervisor password. The default for this option is Not Installed. If a supervisor password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change Supervisor Password.

➔ **Change User Password**

Use the Change User Password to set or change a user password. The default for this option is Not Installed. If a user password must be installed, select this field and enter the

password. After the password has been added, Install appears next to Change User Password.

➔ **Clear User Password**

Use the **Clear User Password** to clear a user password.

➔ **Boot Sector Virus Protection [Disabled]**

Use the Boot Sector Virus Protection to enable or disable boot sector protection.

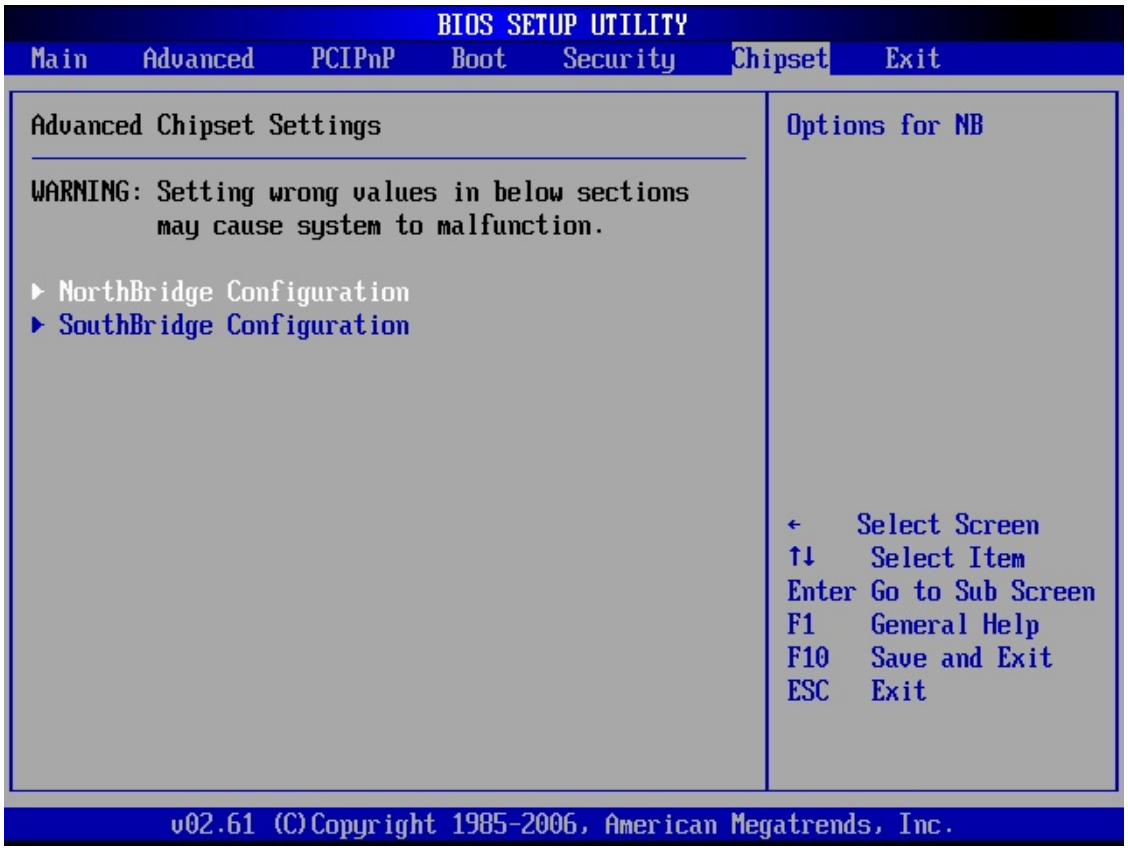
➔	**Disabled**	**DEFAULT**	Disables the boot sector virus protection
➔	**Enabled**		Enables the boot sector virus protection

6.7 Chipset

Use the Chipset menu (**BIOS Menu 21**) to access the Northbridge and Southbridge configuration menus.

WARNING:

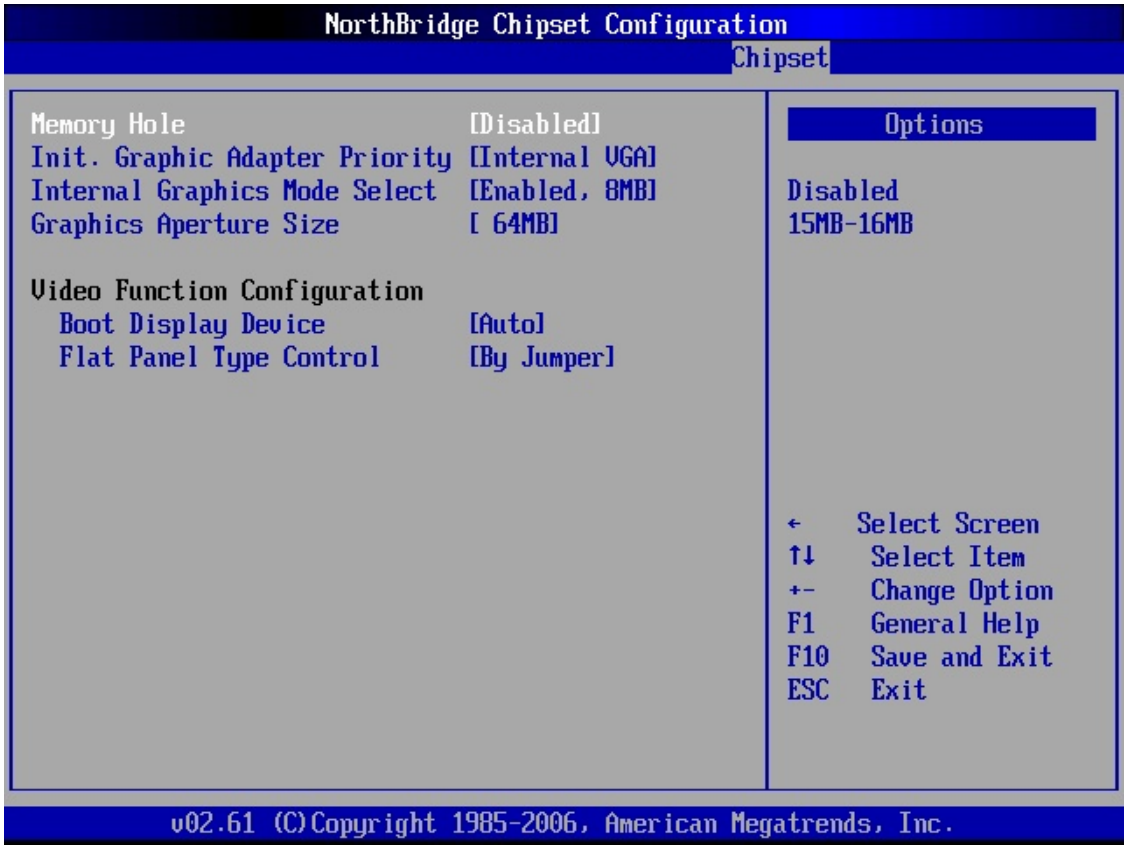
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 21: Chipset

6.7.1 Northbridge Configuration

Use the Northbridge Configuration menu (BIOS Menu 22) to configure the Northbridge chipset.



BIOS Menu 22:Northbridge Chipset Configuration

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards

➔ **15MB** – Between 15MB and 16MB of memory is reserved

16MB		for ISA expansion cards

➔ **Initiate Graphic Adapter [Internal VGA]**

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either VGA or PCI graphics controller. Configuration options are listed below:

- Internal VGA
- PCI/Int-VGA

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the Internal Graphic Mode Select option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**		
➔ **Enable, 1MB**		1MB of memory used by internal graphics device
➔ **Enable, 4MB**		4MB of memory used by internal graphics device
➔ **Enable, 8MB**	**DEFAULT**	8MB of memory used by internal graphics device
➔ **Enable, 16MB**		16MB of memory used by internal graphics device
➔ **Enable, 32MB**		32MB of memory used by internal graphics device

➔ **Graphics Aperture Size [64MB]**

Use the **Graphics Aperture Size** option to specify the size of the AGP aperture.

➔ **64MB**	**DEFAULT**	AGP aperture size is set to 64MB
➔ **128MB**		AGP aperture size is set to 128MB
➔ **256MB**		AGP aperture size is set to 256MB

➔ **Boot Display Device [Auto]**

Use the **Boot Display Device** option to specify which video output to use.

➔ **Auto**	**DEFAULT**	The video output is automatically chosen
➔ **CRT only**		Only VGA is enabled
➔ **LFP only**		Only LFP is enabled
➔ **CRT & LFP**		Both VGA and LFP are enabled

➔ **Flat Panel Type Control [Auto]**

Use the **Boot Display Device** option to specify which video output to use.

➔ **By Jumper**	**DEFAULT**	The screen resolution is set by the jumper settings
➔ **Manually**		The screen resolution is set in the menu below

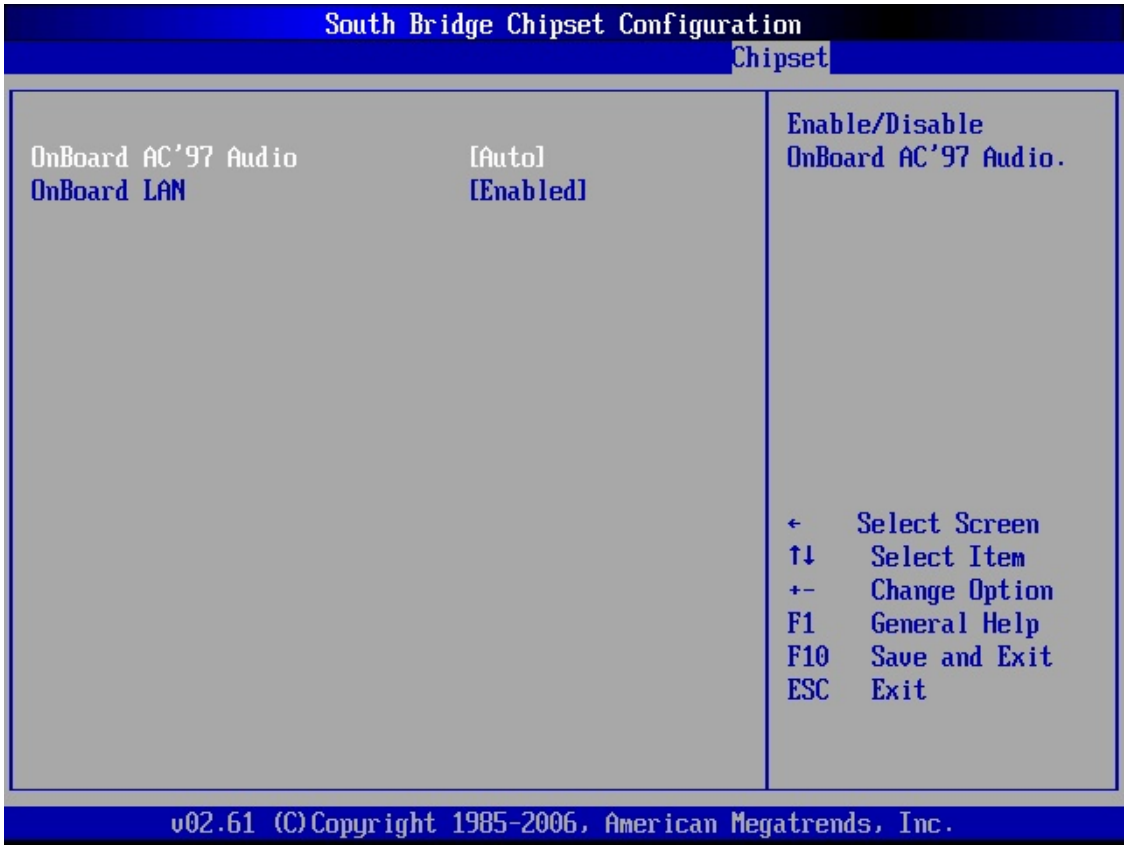
➔ **Flat Panel Type [1- 800x600x18]**

Use the **Flat Panel Type** option to specify the screen resolution of the LVDS monitor. The following options are available.

- **0- 640 x 480 x 18 Bits**
- **1- 800 x 600 x 18 Bits (Default)**
- **2- 1024 x 768 x 18 Bits**
- **3- 1280 x 1024 x 48 Bits**
- **4- 1400 x 1050 x 48 Bits**
- **5- 1400 x 1050 x 36 Bits**
- **6- 1600 x 1200 x 48 Bits**
- **7- 1280 x 768 x 18 Bits**
- **8- 1600 x 1050 x 48 Bits**
- **9- 1920 x 1200 x 36 Bits**
- **10- 1024 x 768 x 24 Bits**

6.7.2 Southbridge Chipset Configuration

The Southbridge Chipset Configuration menu (**BIOS Menu 23**) configures the Southbridge chipset.



BIOS Menu 23: Southbridge Chipset Configuration

➔ **OnBoard AC'97 Audio [Auto]**

The **Audio Controller** option enables or disables the audio controller.

➔ **Auto** **DEFAULT** The onboard audio controller is automatically detected and enabled.

➔ **Disabled** The onboard audio controller is disabled.

➔ **Onboard LAN [Enabled]**

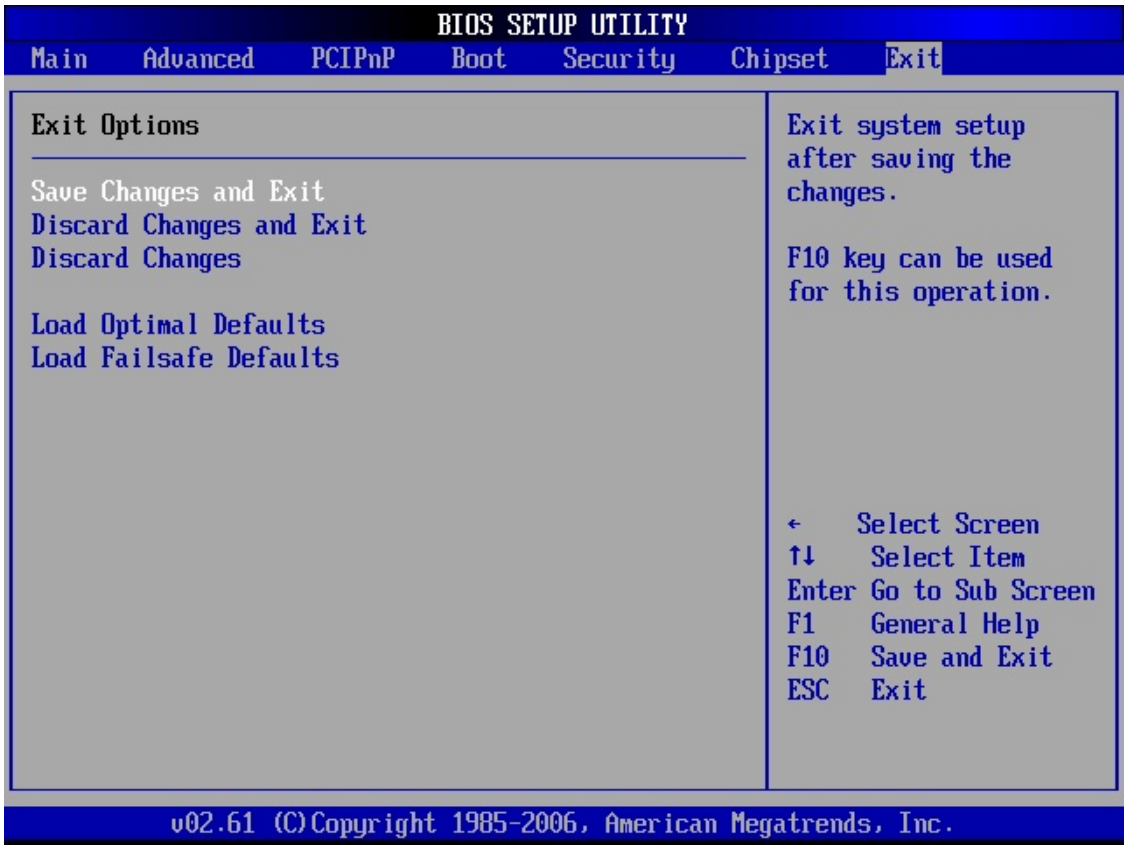
The **Onboard LAN** option enables or disables the onboard LAN.

➔ **Enabled** **DEFAULT** The onboard LAN device automatically detected and enabled

➔ **Disabled** Onboard LAN device manually disabled

6.8 Exit

Use the Exit menu (**BIOS Menu 24**) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

BIOS Menu 24:Exit

➔ **Save Changes and Exit**

Use the Save Changes and Exit option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the Discard Changes and Exit option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the Discard Changes option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the Load Optimal Defaults option to load the optimal default values for each of the parameters on the Setup menus. F9 key can be used for this operation.

➔ **Load Failsafe Defaults**

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.

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Chapter

7

Driver Installation

7.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the IEI website or contact technical support for the latest updates.

The following drivers can be installed on the system.

- Chipset driver - \1-INF\6.3.0.1007
- VGA driver - \2-VGA\WIN2K_XP\14.19.50.4497
- LAN driver - \3-LAN\Intel\Intel 82562ET\WIN_2KXP
- USB driver - \4-USB2.0\Intel\WinXP
- Audio driver - \5-Audio\ALC655\Windows\Windows 98Gold, 98se, Me, 2000, XP, 2003(32,64 bits)
- SATA driver - \6-SATA RAID\VT 6421\VIA-Windows_Falcon_IDE-V220A\SATAIDE\WXP

Installation instructions are given below.

7.2 Driver CD Auto-run

NOTE:

All the instructions that follow are for a Windows operating system.

All the drivers for the IOWA-8522 are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

Step 2: The CD starts up automatically

Step 3: Select IOWA-8522 from the initial menu shown in Figure 7-1.

Figure 7-1: Introduction Screen

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

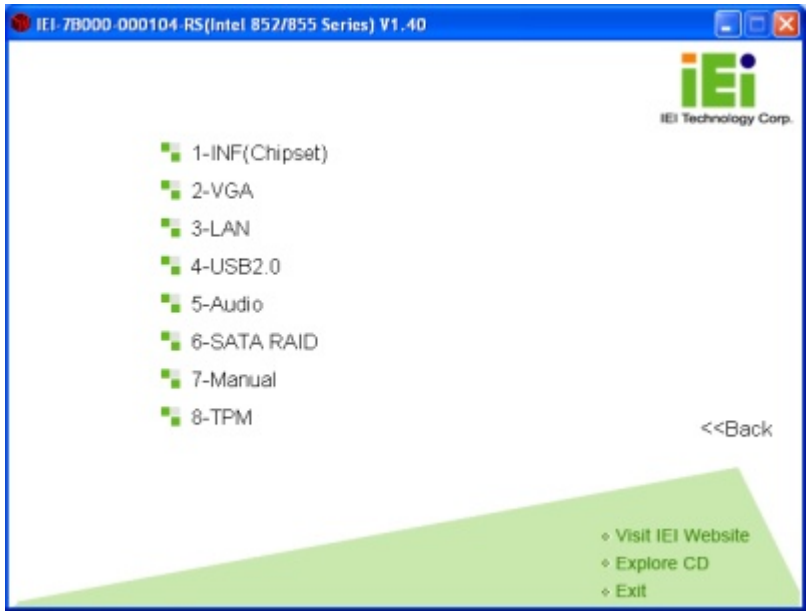

Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**.

7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

Step 1: Click INF in Figure 7-2.

Step 2: Browse to "**E:\ 1-INF\6.3.0.1007**" (Figure 7-3).

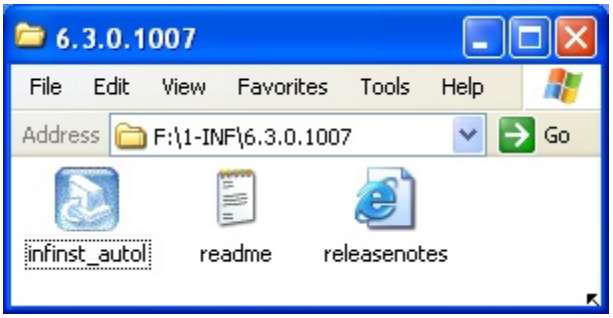

Figure 7-3: Chipset Driver Icon

Step 3: Double click the **infinst_autol** icon.

Step 4: The "Welcome" window in Figure 7-4 appears next.

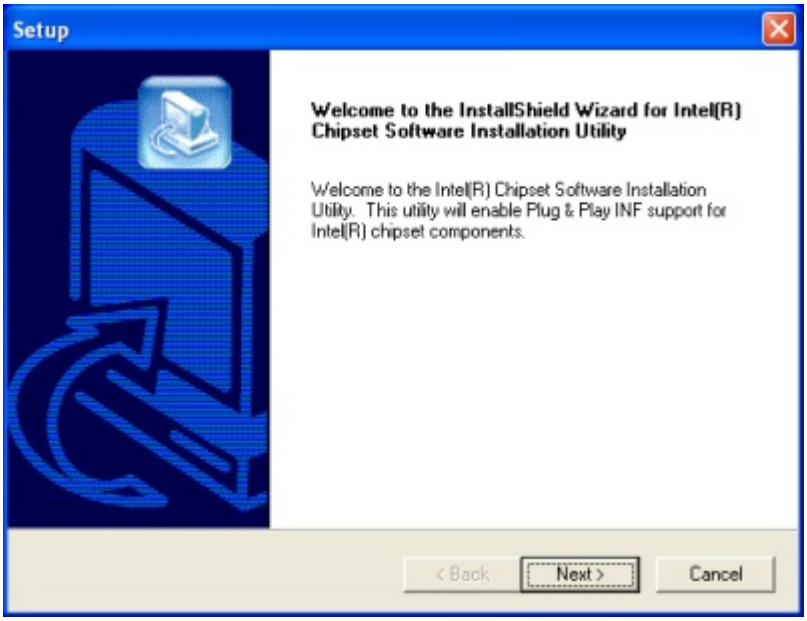
Setup
Welcome to the InstallShield Wizard for Intel(R) Chipset Software Installation Utility
Welcome to the Intel(R) Chipset Software Installation Utility. This utility will enable Plug & Play INF support for Intel(R) chipset components.
< Back
Next >
Cancel

Figure 7-4: Welcome Screen

Step 5: Click “Next” and the license agreement shown in Figure 7-5 appears.

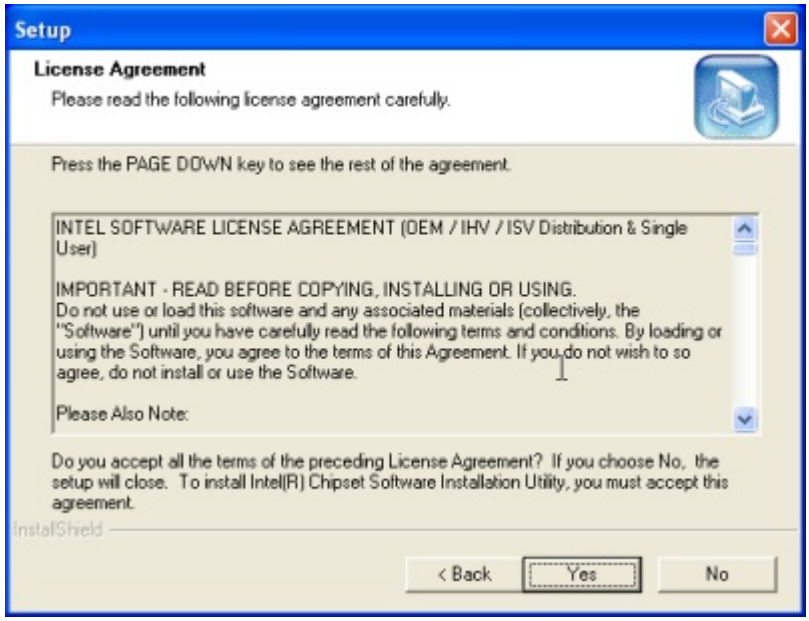
Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install Intel(R) Chipset Software Installation Utility, you must accept this agreement.
InstallShield
< Back
Yes
No

Figure 7-5: License Agreement

Step 6: Agree to the license terms by clicking “**Yes**”. The “**Readme**” in **Figure 7-6** appears.

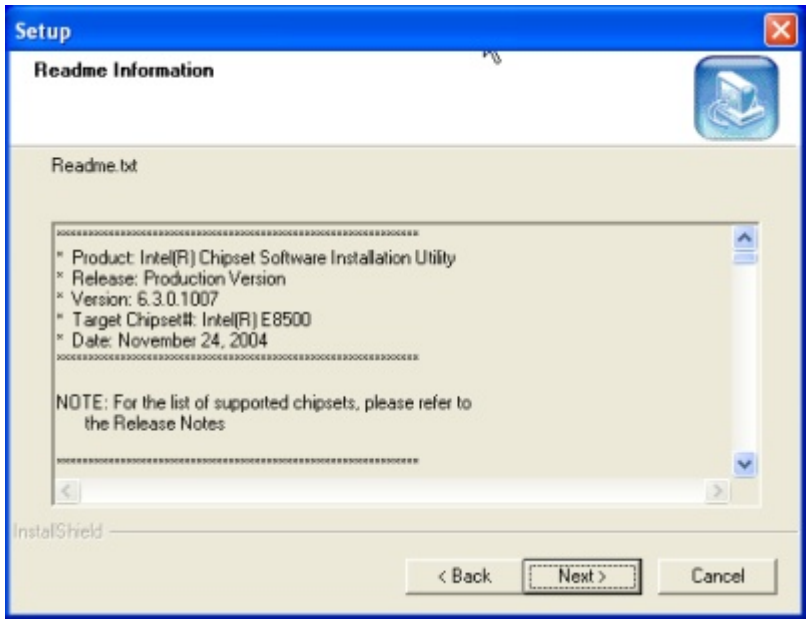

Figure 7-6: Readme Information

Step 7: Click "**Next**". The driver is installed on the computer. After the installation is complete, the installation complete screen shown in **Figure 7-7** appears. Select the preferred option and click "**Finish**" to complete the installation process.

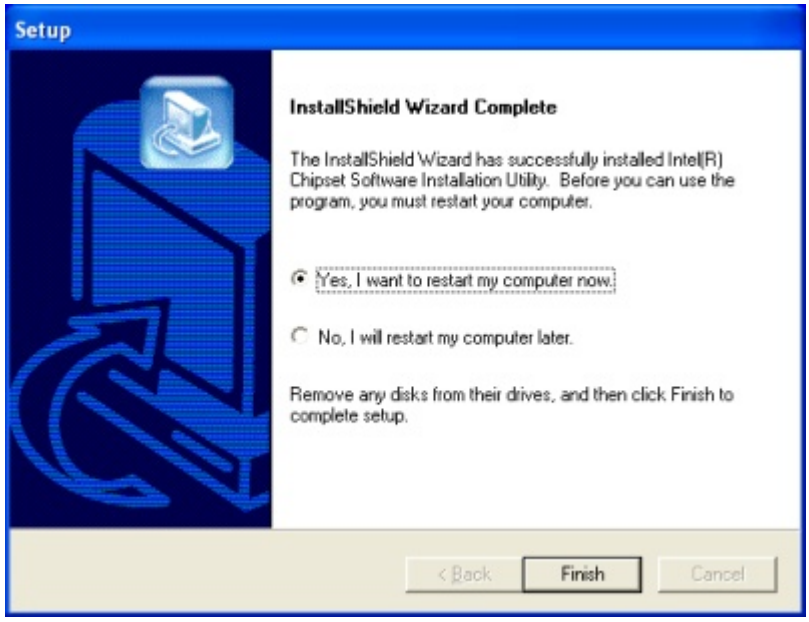
Setup
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Intel(R) Chipset Software Installation Utility. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-7: Restart the Computer

7.4 Intel Graphics Media Accelerator Driver

To install the GMA driver, please follow the steps below:

Step 1: Click VGA in Figure 7-2. The window in **Figure 7-8** appears.

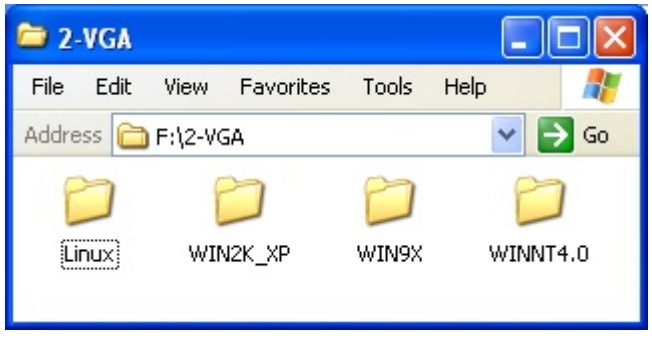

Figure 7-8: Operating Systems

Step 2: Select the operating system being used on the system. The screen in **Figure 7-9** appears.

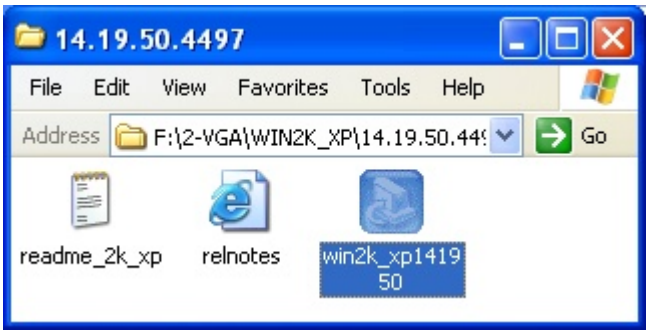

Figure 7-9: VGA Setup Icon

Step 3: Double click the Setup icon.

Step 4: Click **NEXT** to continue the installation.

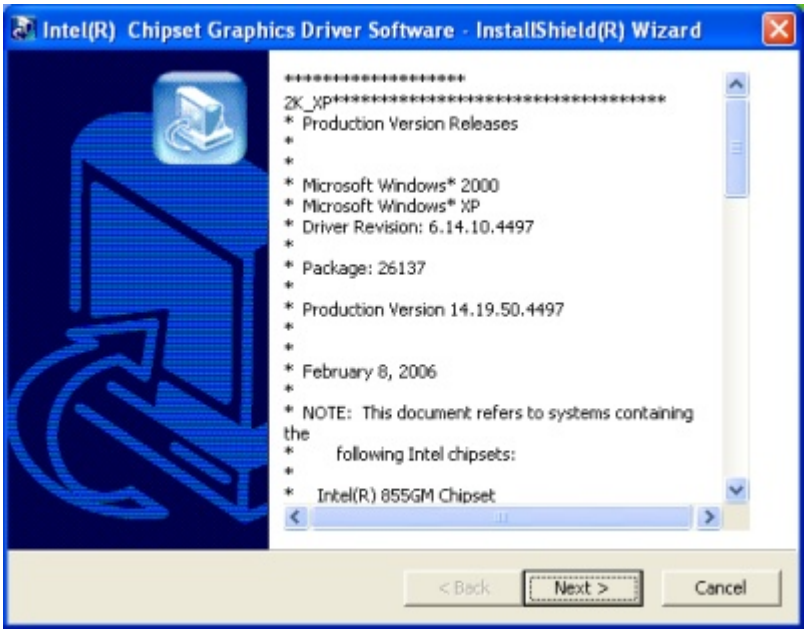
Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
2K_XP
* Production Version Releases
* Microsoft Windows* 2000
* Microsoft Windows* XP
* Driver Revision: 6.14.10.4497
* Package: 26137
* Production Version 14.19.50.4497
* February 8, 2006
* NOTE: This document refers to systems containing the following Intel chipsets:
* Intel(R) 855GM Chipset
< Back
Next >
Cancel

Figure 7-10: GMA Installation Screen

Step 5: The welcome screen shown in **Figure 7-11** appears.

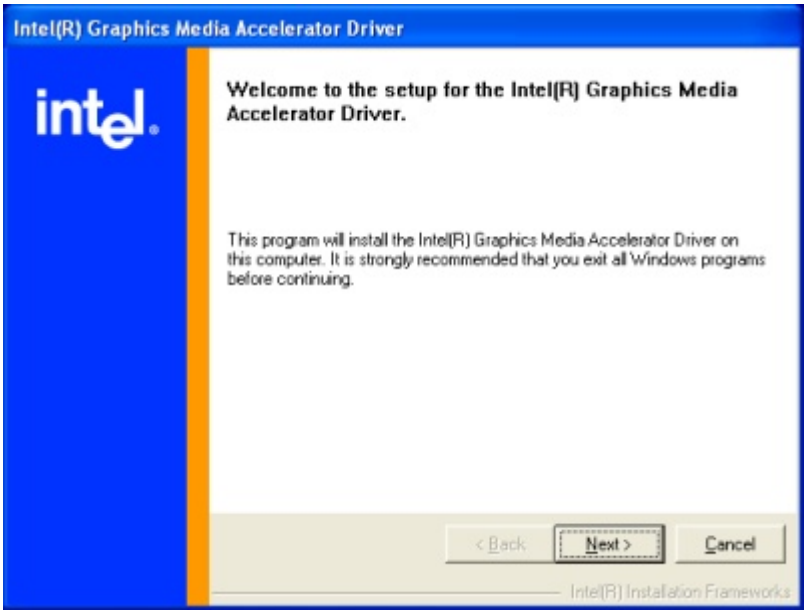
Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

Figure 7-11: GMA Driver Installation Welcome Screen

Step 6: To continue installing click "**Next**" and a license agreement shown in **Figure 7-12** appears. Read through the license agreement.

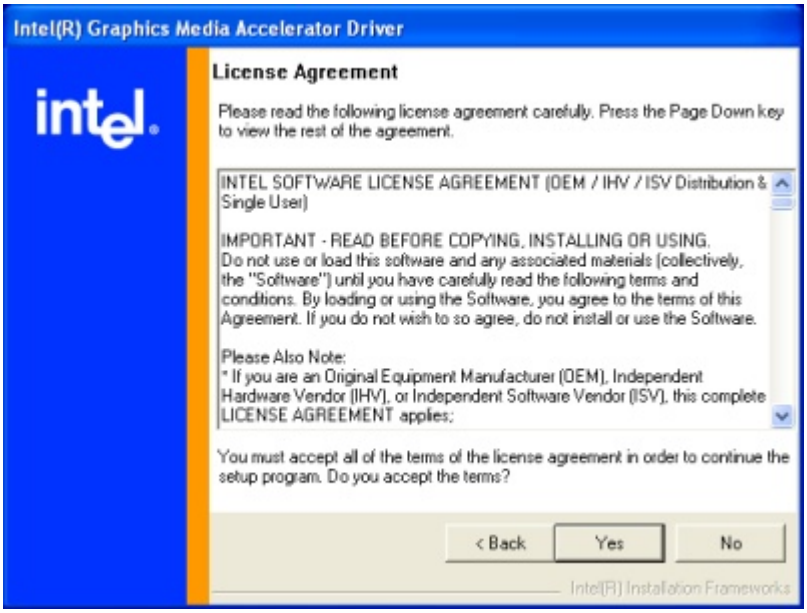
Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

Figure 7-12: GMA Driver License Agreement

Step 7: Accept the terms and conditions stipulated in the license agreement by clicking the "**Yes**" button (**Figure 7-12**). The installation notice shown in **Figure 7-13** appears.

Figure 7-13: GMA Driver Installing Notice

Step 8: After the driver installation process is complete, a confirmation screen shown in **Figure 7-14** appears.

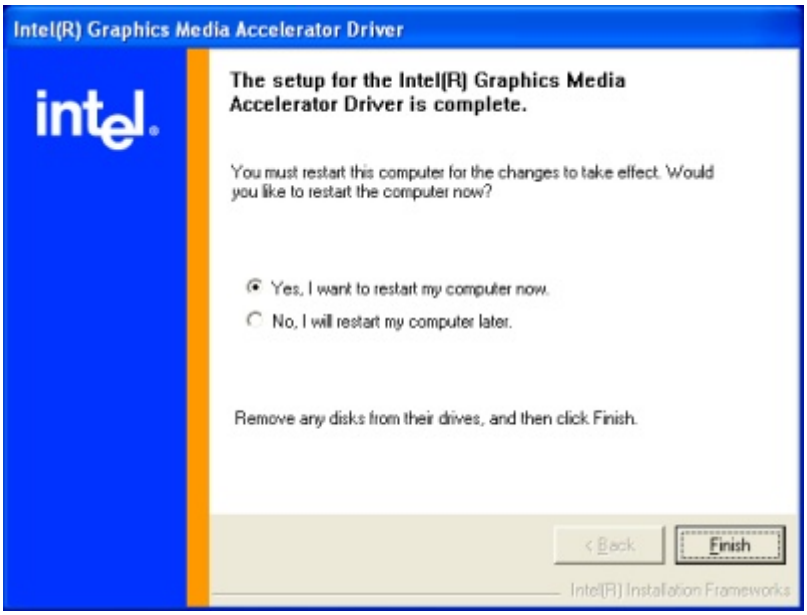
Intel(R) Graphics Media Accelerator Driver
intel
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish
Intel(R) Installation Frameworks

Figure 7-14: GMA Driver Installation Complete

Step 9: Click "**Finish"** to restart the computer.

7.5 Intel® Network Adapter Installation

To install the Intel® Network Adapter, please follow the steps below.

Step 1: Click "**LAN**" in **Figure 7-2**.

Step 2: Double-click the "Intel" folder **(**Figure 7-15).

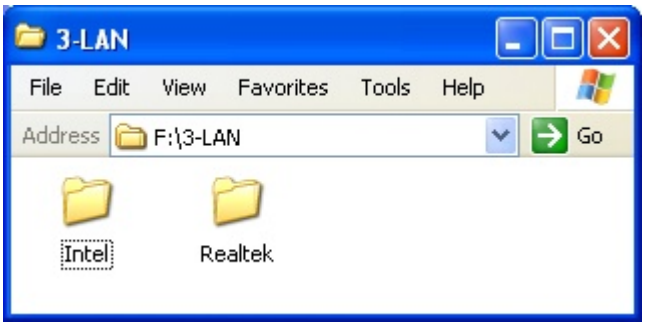

Figure 7-15: Select the Driver Folder

Step 3: Double-click the "Intel 82562ET" folder (Figure 7-16).

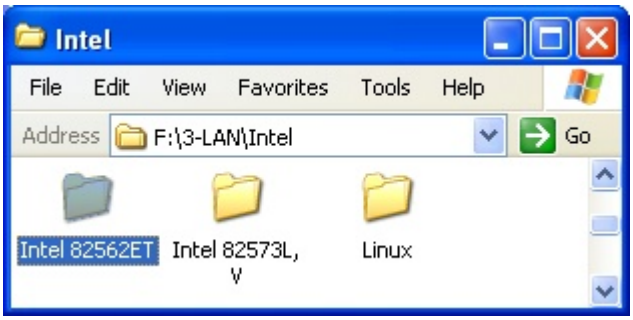

Figure 7-16: Select the Chipset Folder

Step 4: Double-click the folder for the operating system (Figure 7-16).

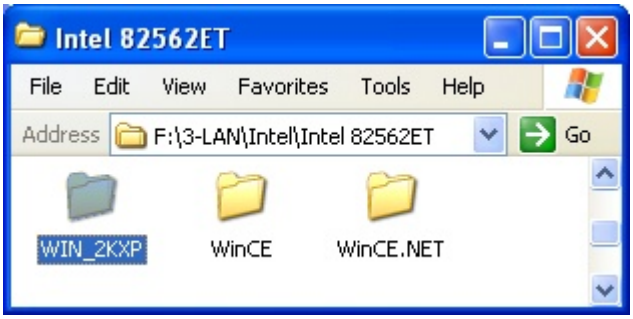

Figure 7-17: Select the Operating System Folder

Step 5: Double-click the folder of the latest driver version (12.1) (Figure 7-16).

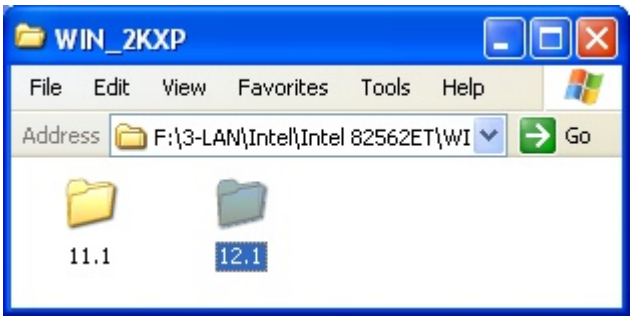

Figure 7-18: Select the Driver Version

Step 6: Double-click the installation file (Figure 7-16).

Figure 7-19: Select the Installation File

Step 7: Click Next in network adapter welcome screen (Figure 7-20).

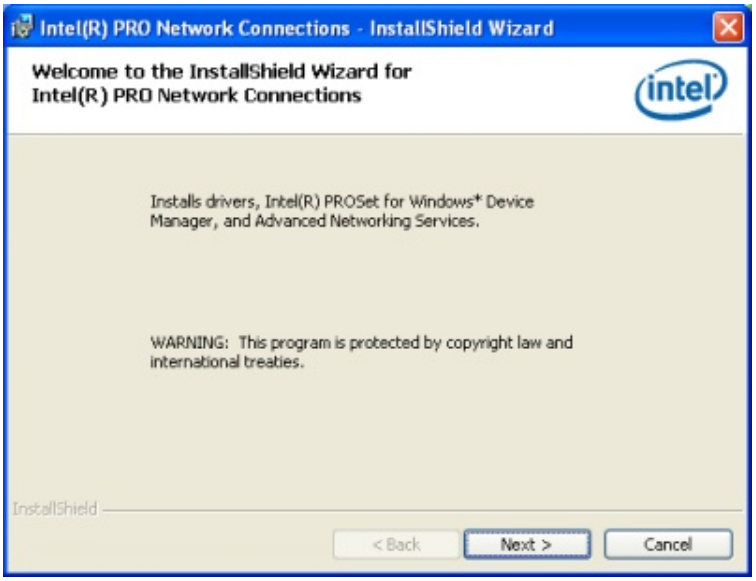
Intel(R) PRO Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for Intel(R) PRO Network Connections
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

Figure 7-20: Network Adapter Welcome

Step 8: Accept the terms of the license agreement to continue. To accept the terms and conditions stipulated in the agreement, select "**I accept the terms**…" then click **NEXT**.

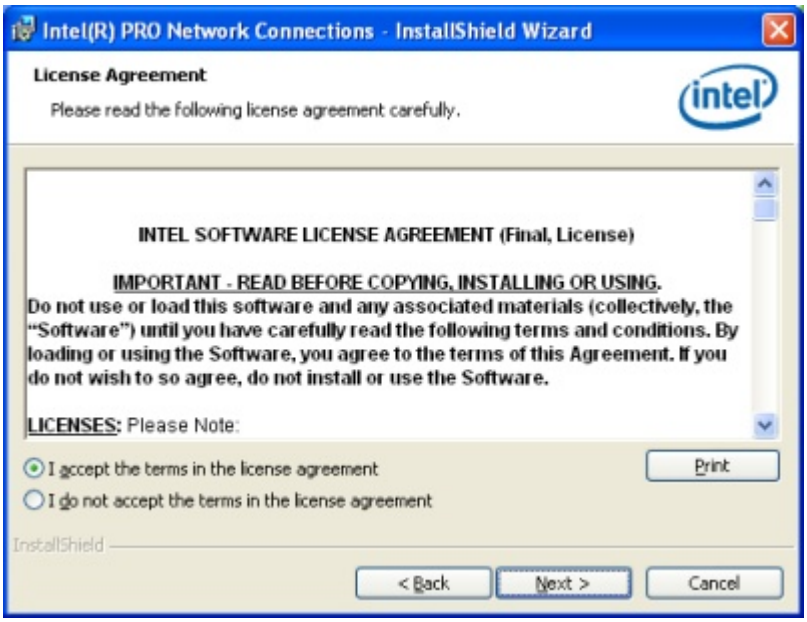
Intel(R) PRO Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT (Final, License)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
LICENSES: Please Note:
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

Figure 7-21: Network Adapter License Agreement

Step 9: Select “Driver, Intel® PROSet, and Advanced Network Services” in the **Setup Options** window. Click **NEXT** to continue (Figure 7-22).

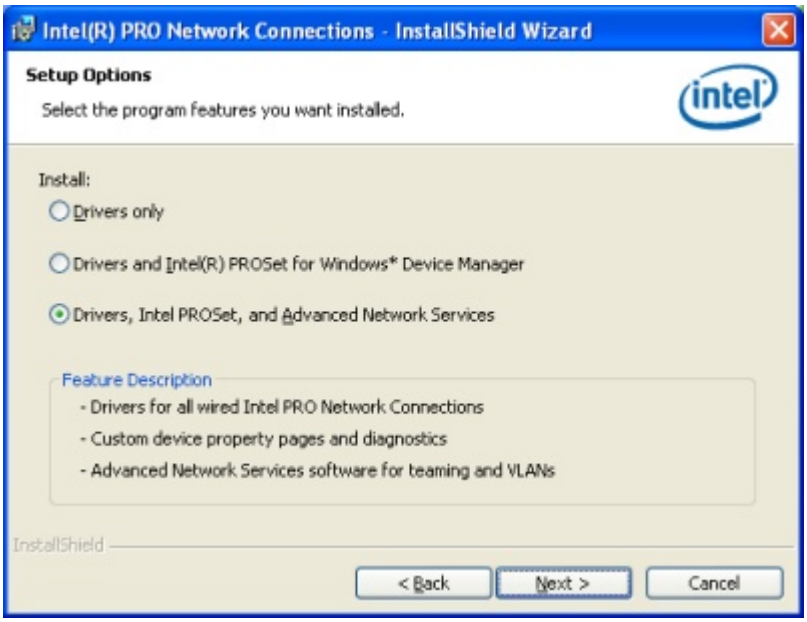
Intel(R) PRO Network Connections - InstallShield Wizard
Setup Options
Select the program features you want installed.
intel
Install:
Drivers only
Drivers and Intel(R) PROSet for Windows* Device Manager
Drivers, Intel PROSet, and Advanced Network Services
Feature Description
- Drivers for all wired Intel PRO Network Connections
- Custom device property pages and diagnostics
- Advanced Network Services software for teaming and VLANs
InstallShield
< Back
Next >
Cancel

Figure 7-22: Network Adapter Setup Options

Step 10: Click **INSTALL** to begin installation (Figure 7-23).

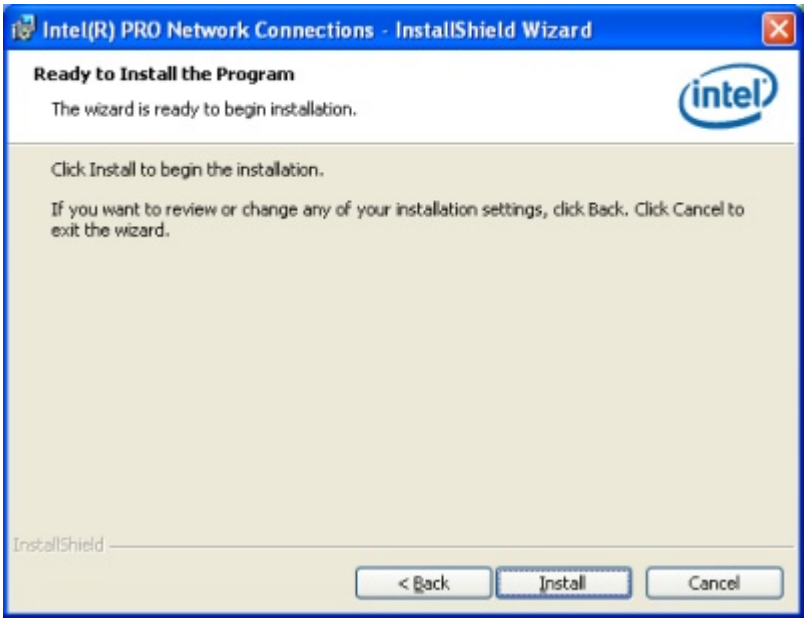
Intel(R) PRO Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
intel
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

Figure 7-23: Network Adapter Begin Installation

Step 11: Files are extracted and installed (Figure 7-24).

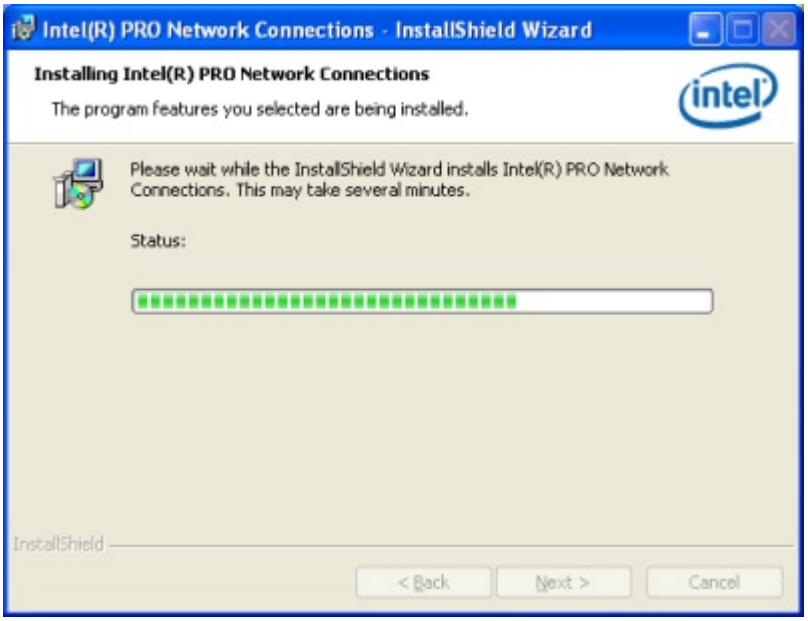
Intel(R) PRO Network Connections - InstallShield Wizard
Installing Intel(R) PRO Network Connections
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs Intel(R) PRO Network Connections. This may take several minutes.
Status:
InstallShield
< Back
Next >
Cancel

Figure 7-24: File Extraction

Step 12: Click **Finish** to complete driver installation (Figure 7-25).

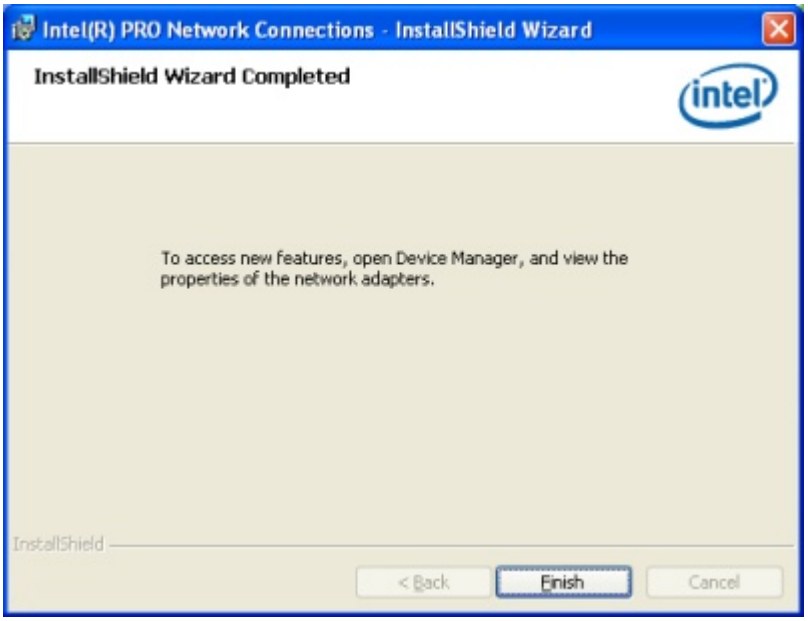
Intel(R) PRO Network Connections - InstallShield Wizard
InstallShield Wizard Completed
To access new features, open Device Manager, and view the properties of the network adapters.
InstallShield
< Back
Finish
Cancel

Figure 7-25: Intel® Pro Network Connections

7.6 Intel® USB 2.0 Installation

To install the Intel® USB 2.0 driver, please follow the steps below.

Step 1: Select **USB2.0** from the list in **Figure 7-2**.

Step 2: Double-click the **Intel** folder (Figure 7-26).

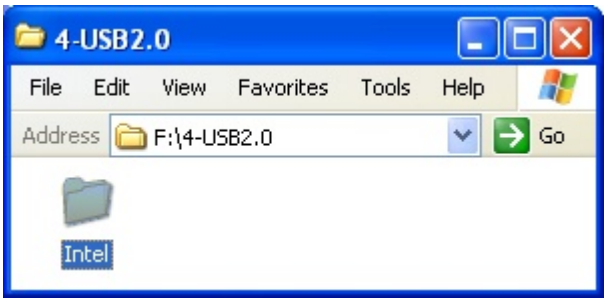

Figure 7-26: USB2.0 Window

Step 3: Double-click the appropriate OS folder (Figure 7-27).

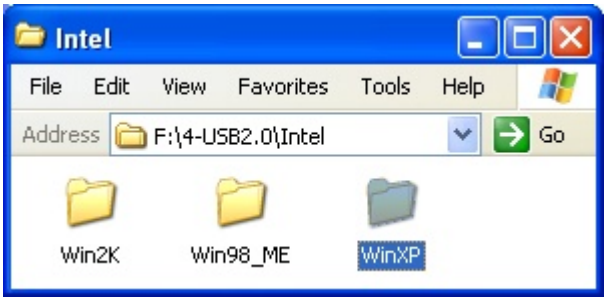

Figure 7-27: USB2.0 OS Options

NOTE:

The remainder of this installation assumes the use of Windows XP as the operating system.

Step 4: Double-click the **USB20.exe** program icon (Figure 7-28).

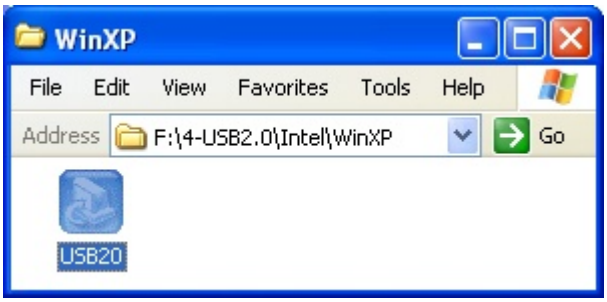

Figure 7-28: Windows XP USB 2.0 Program Icon

Step 5: Click **NEXT** in the **InstallShield Wizard** welcome screen (Figure 7-29).

InstallShield Wizard
Welcome to the InstallShield Wizard for the USB2.0 driver installation.
The InstallShield(R) Wizard will install the USB2.0 drivers on your computer. Please verify that you have installed the corresponding QFEs before this install. To continue, click Next.
< Back
Next >
Cancel

Figure 7-29: USB 2.0 InstallShield Wizard Welcome Screen

Step 6: Click **NEXT** to continue after reading the license agreement (Figure 7-30).

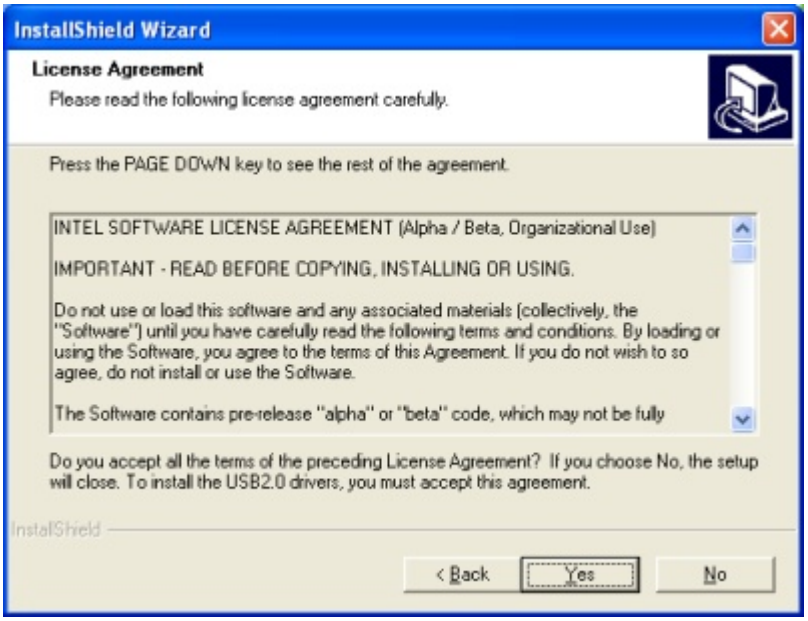
InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (Alpha / Beta, Organizational Use)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
The Software contains pre-release "alpha" or "beta" code, which may not be fully
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install the USB2.0 drivers, you must accept this agreement.
InstallShield
< Back
Yes
No

Figure 7-30: USB 2.0 License Agreement

Step 7: Driver installation continues. Click **CANCEL** at any time to stop the installation (Figure 7-31**)**.

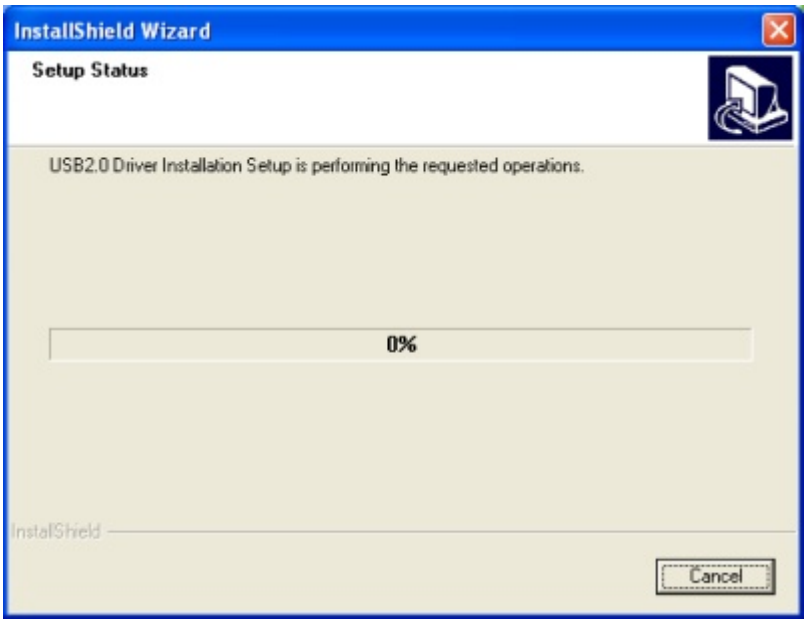

Figure 7-31: USB 2.0 Driver Installed

Step 8: After the driver installation process is complete, a confirmation screen appears (Figure 7-32).

InstallShield Wizard
InstallShield Wizard Complete
Setup has completed installing.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-32: USB 2.0 Driver Installation Complete

Step 9: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 Realtek Audio Driver Installation

To install the Realtek AC'97 Audio driver, please follow the steps below:

Step 1: Click "**Audio**" in Figure 7-2.

Step 2: Double-click the **ALC655** folder (Figure 7-33).

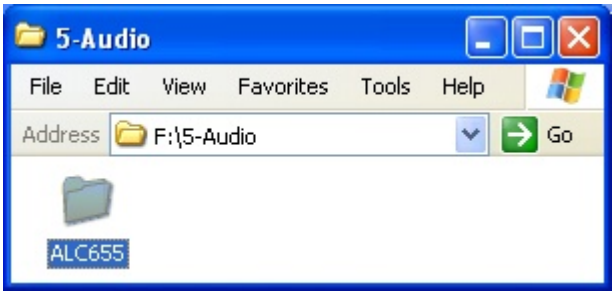

Figure 7-33: ALC655 Directory Icon

Step 3: Double-click the folder for the operating system (Figure 7-34).

Figure 7-34: Audio Driver Operating System

Step 4: If the Windows directory was selected, choose the specific version of Windows to be installed (Figure 7-35).

Figure 7-35: Audio Driver Setup Icon

Step 5: Double-click the Setup icon (**WDM_A384**) in Figure 7-35.

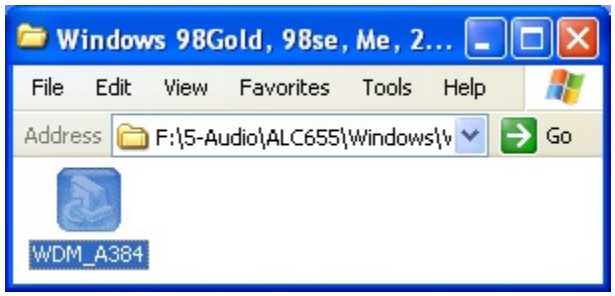

Figure 7-36: Audio Driver Setup Icon

Step 6: Click the "**Next**" button in the **Audio Driver Welcome Screen**. (**Figure 7-37)**

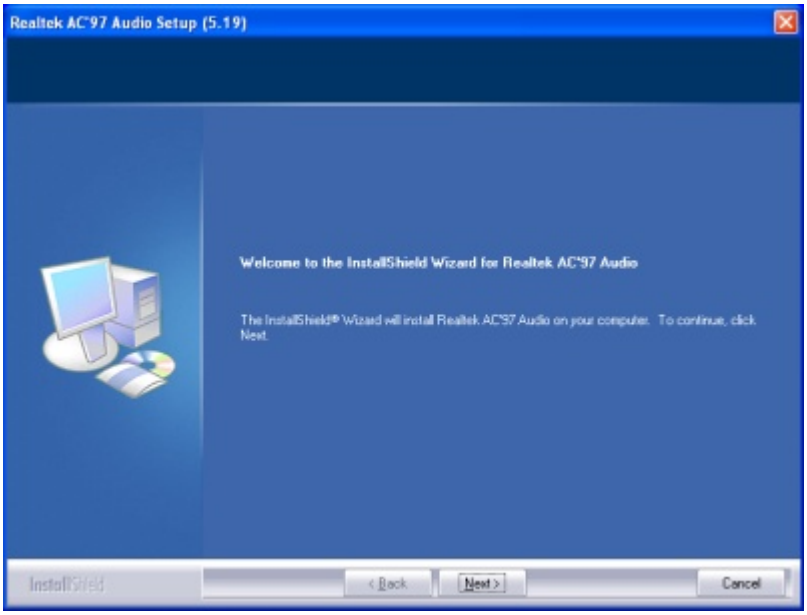
Realtek AC'97 Audio Setup (5.19)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Figure 7-37: Audio Driver Welcome Screen

Step 7: Click the "**CONTINUE ANYWAY**" button in the popup warning screen.

Software Installation
The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Figure 7-38: Audio Driver Welcome Screen

Step 8: After the driver installation process is complete, a confirmation screen shown in **Figure 7-39** appears.

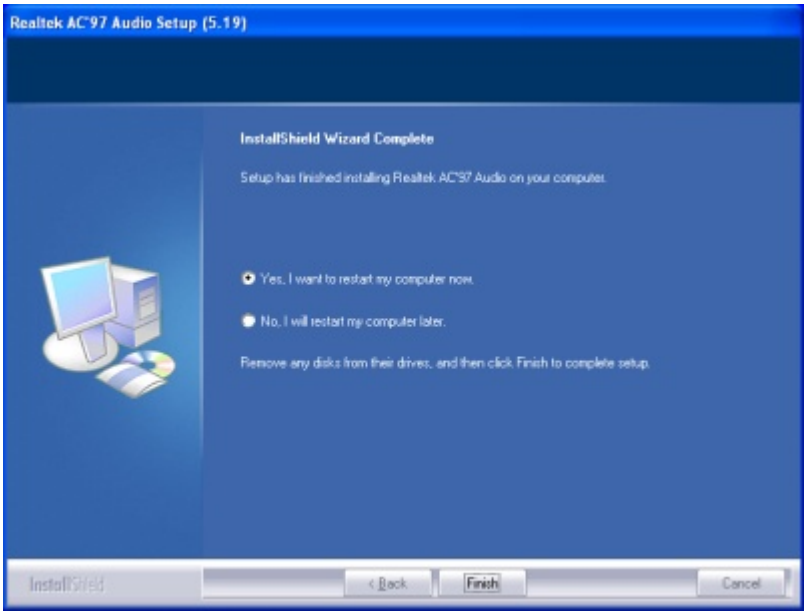
Realtek AC'97 Audio Setup (5.19)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Figure 7-39: Audio Driver Installation Complete

Step 9: Restart the computer so the new settings take effect.

7.8 VIA® VT6421 RAID Driver

To install the **VIA® SATA/RAID** driver, please follow the steps below.

Step 1: Select **"SATA"** from the menu in Figure 7-2.

Step 2: Double-click the **VT 6421** (Figure 7-40).

Figure 7-40: SATA Driver Folder

Step 3: Double-click the **VT 6421** folder (Figure 7-40).

Figure 7-41: SATA Driver Folder

Step 4: Double-click the **V-RAID_V560A** folder (Figure 7-42).

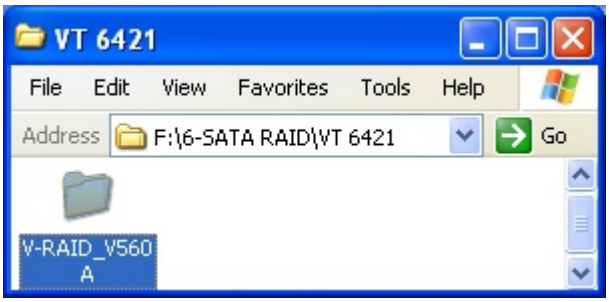

Figure 7-42: VIA® Driver Folder

Step 5: Double-click the **SETUP** icon (Figure 7-42).

Figure 7-43: RAID Setup File

Step 6: Click **NEXT** in the **VIA® RAID Driver Setup** welcome screen (Figure 7-44).

VIA V-RAID Software Package V5.60a
Hyperion Pro
Welcome to the Install Wizard for VIA V-RAID Software Setup Wizard
The Install Wizard will install VIA V-RAID Software Setup Wizard on your computer. To continue, click Next.
< Back
Next >
Cancel
U-Version:5.2.1.24

Figure 7-44: VIA® RAID Driver Setup

Step 7: Click "**NEXT**" in the license agreement window (Figure 7-45).

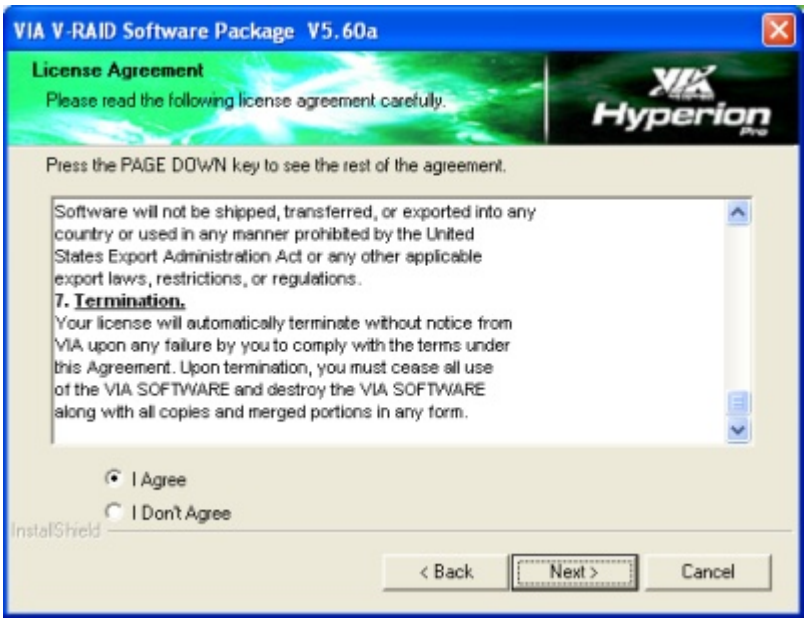
VIA V-RAID Software Package V5.60a
License Agreement
Please read the following license agreement carefully.
Hyperion Pro
Press the PAGE DOWN key to see the rest of the agreement.
Software will not be shipped, transferred, or exported into any country or used in any manner prohibited by the United States Export Administration Act or any other applicable export laws, restrictions, or regulations.
7. Termination.
Your license will automatically terminate without notice from VIA upon any failure by you to comply with the terms under this Agreement. Upon termination, you must cease all use of the VIA SOFTWARE and destroy the VIA SOFTWARE along with all copies and merged portions in any form.
I Agree
I Don't Agree
InstallShield
< Back
Next >
Cancel

Figure 7-45: VIA® RAID License Agreement

Step 8: Select the **"VIA® V-RAID Driver Package V5.60a"** and **"VIA® V-RAID Config Utility V5.40"** then click "**NEXT**" (Figure 7-45).

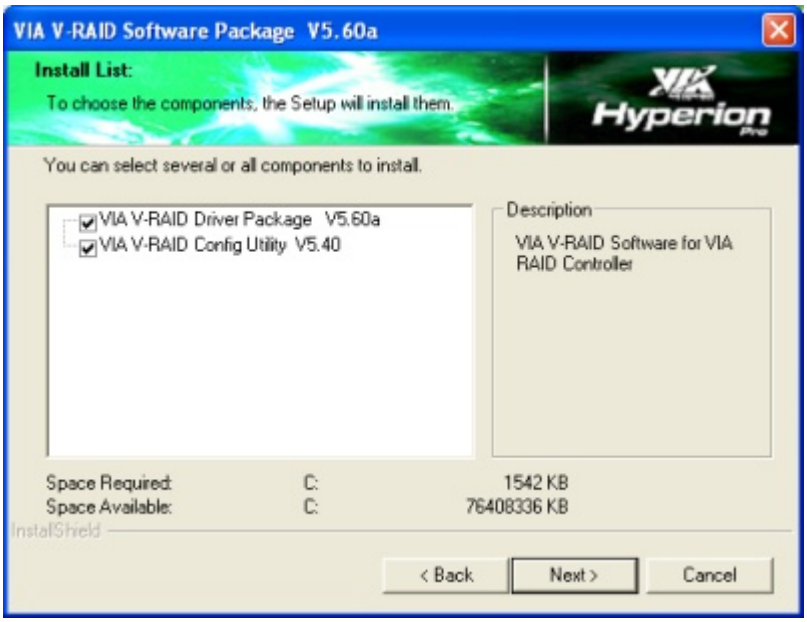
VIA V-RAID Software Package V5.60a
Install List:
To choose the components, the Setup will install them.
Hyperion
You can select several or all components to install.
VIA V-RAID Driver Package V5.60a
VIA V-RAID Config Utility V5.40
Description
VIA V-RAID Software for VIA RAID Controller
Space Required: C: 1542 KB
Space Available: C: 76408336 KB
InstallShield
< Back
Next >
Cancel

Figure 7-46: VIA® Software Installation Options

Step 9: Click "**NEXT**" to continue the installation (Figure 7-45).

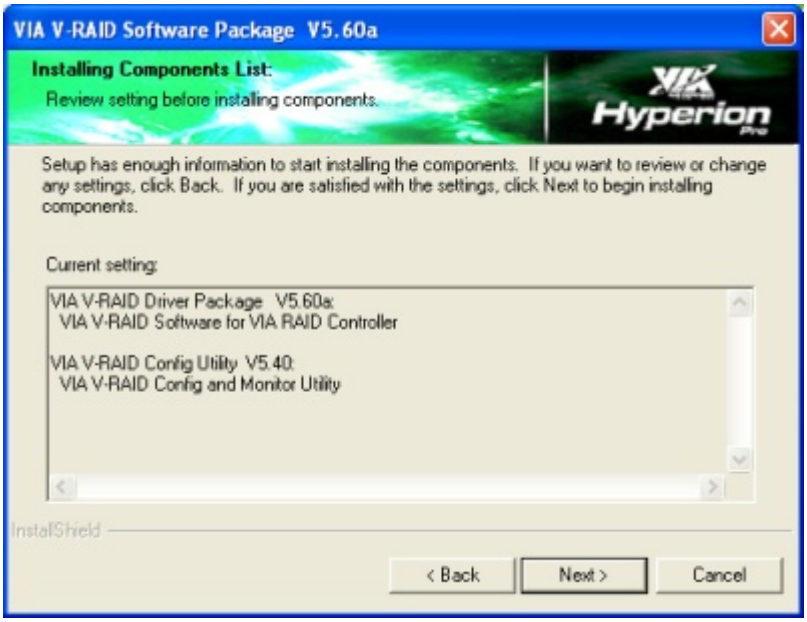
VIA V-RAID Software Package V5.60a
Installing Components List:
Review setting before installing components.
Hyperion
Setup has enough information to start installing the components. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin installing components.
Current setting:
VIA V-RAID Driver Package V5.60a:
VIA V-RAID Software for VIA RAID Controller
VIA V-RAID Config Utility V5.40:
VIA V-RAID Config and Monitor Utility
InstallShield
< Back
Next >
Cancel

Figure 7-47: VIA® RAID Driver Confirmation

Step 10: Click "**NEXT**" to continue the installation (Figure 7-45).

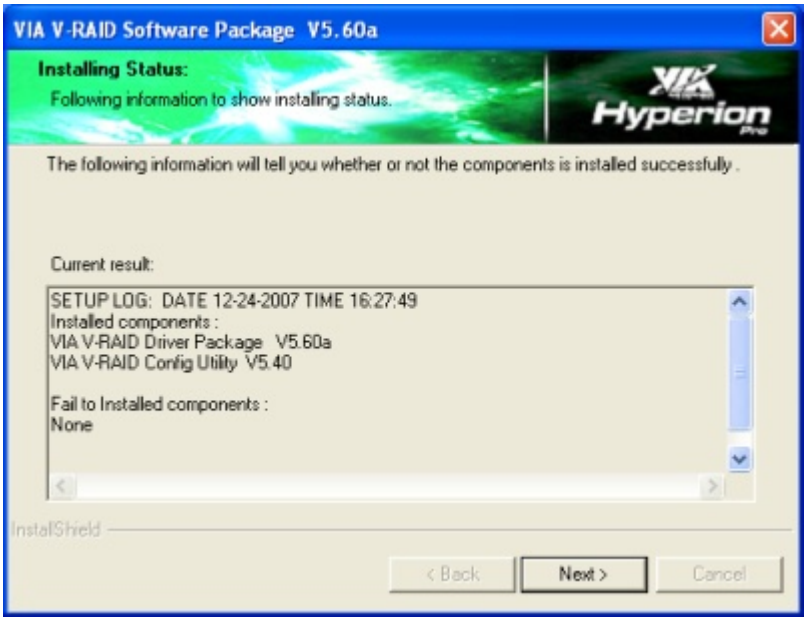
VIA V-RAID Software Package V5.60a
Installing Status:
Following information to show installing status.
Hyperion Pro
The following information will tell you whether or not the components is installed successfully.
Current result:
SETUP LOG: DATE 12-24-2007 TIME 16:27:49
Installed components :
VIA V-RAID Driver Package V5.60a
VIA V-RAID Config Utility V5.40
Fail to Installed components :
None
InstallShield
< Back
Next >
Cancel

Figure 7-48: VIA® RAID Driver Installation Complete

Step 11: Save any open documents or files. Close any other applications that are running on the computer. Choose "**Yes, I want to restart my computer now.**" Then click "**NEXT**" to restart the computer (Figure 7-45).

VIA V-RAID Software Package V5.60a
Hyperion Pro
Install Wizard Completed.
The Install Wizard has successfully installed VIA V-RAID Software Setup Wizard. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

Figure 7-49: VIA® RAID Driver Installation Complete

Appendix

A

BIOS Menu Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 6**.

- ➔ **System Overview 110**
- ➔ **System Time [xx:xx:xx] 111**
- ➔ **System Date [xx/xx/xx] 111**
- ➔ **ATA/IDE Configurations [Compatible] 114**
- ➔ **Legacy IDE Channels [PATA Pri, SATA Sec] 115**
- ➔ **IDE Master and IDE Slave 115**
- ➔ **Auto-Detected Drive Parameters 116**
- ➔ **Type [Auto] 117**
- ➔ **ZIP 117**
- ➔ **LS-120 ..... 117**
- ➔ **LBA/Large Mode [Auto] 118**
- ➔ **Block (Multi Sector Transfer) [Auto] 118**
- ➔ **PIO Mode [Auto] 118**
- ➔ **DMA Mode [Auto] 119**
- ➔ **S.M.A.R.T [Auto] 120**
- ➔ **32Bit Data Transfer [Enabled] 121**
- ➔ **Floppy A/B 122**
- ➔ **Serial Port1 Address [3F8/IRQ4] 123**
- ➔ **Serial Port2 Address [2F8/IRQ3] 123**
- ➔ **Serial Port2 Mode [Normal] 123**
- ➔ **IR Duplex Mode [Half Duplex] 124**
- ➔ **Parallel Port Address [Disabled] 124**
- ➔ **Parallel Port Mode [Normal] 124**
- ➔ **Parallel Port IRQ [IRQ7] 125**
- ➔ **AT/ATX Power [Auto] 128**
- ➔ **Suspend Mode [S1(POS)] 129**
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- Change Supervisor Password 149
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➔ Internal Graphics Mode Select [Enable, 8MB] 153
➔ Graphics Aperture Size [64MB] 153
➔ Boot Display Device [Auto] 154
➔ Flat Panel Type Control [Auto] 154
➔ Flat Panel Type [1- 800x600x18] 154
➔ OnBoard AC'97 Audio [Auto] 155
➔ Onboard LAN [Enabled] 156
➔ Save Changes and Exit 158
➔ Discard Changes and Exit 158
➔ Discard Changes 158
➔ Load Optimal Defaults 158
➔ Load Failsafe Defaults 158

Appendix

B

Terminology

AC ’97	Audio Codec 97 (AC’97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude (“volume”) of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.

DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer

	storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.
LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.

UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

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Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table C-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

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Appendix

D

Address Mapping

D.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	SiS661CX Graphics Controller
3C0-3DF	SiS661CX Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table D-1: IO Address Map

D.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table D-2: 1st MB Memory Address Map

D.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table D-3: IRQ Mapping Table

D.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table D-4: IRQ Mapping Table

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Appendix

E

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the IOWA-8522

E.1 Compatible Operating Systems

The following operating systems have been successfully run on the IOWA-8522.

- MS-DOS 6.22
- Microsoft Windows XP (32-bit)
- Microsoft Windows 2000
- Red Hat 9.0

E.2 Compatible Processors

The following Intel® Socket 478 processors have been successfully tested on the IOWA-8522

CPU	FSB	Frequency	L2 Cache
Intel® Pentium 4	800MHz	3.2GHz	1MB

E.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the IOWA-8522 other memory modules that comply with the specifications may also work on the IOWA-8522 but have not been tested.

The following memory modules have been successfully tested on the IOWA-8522.

Manufacturer	Model No.	Capacity	Speed	Type
Kingston	KVR400X64C3A	512 MB	400 MHz	DDR

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Appendix

F

Hazardous Materials Disclosure

F.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	x	O	O	O	O	x
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国RoHS标准。以下表格标示此产品中某有毒物质的含量符合中国RoHS标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。

Appendix

G

AC’ 97 Audio Codec

G.1 Introduction

The motherboard comes with an onboard Realtek ALC655 CODEC. The ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC that provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions.

G.1.1 Accessing the AC’ 97 CODEC

The CODEC is accessed through the phone jacks on the rear panel of the motherboard. The phone jacks include:

- LINE IN
- LINE OUT
- MIC IN

G.1.2 Driver Installation

The driver installation has been described in **Section 7.7**.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure G-1**). If the peripheral speakers are properly connected, sound effects should be heard.

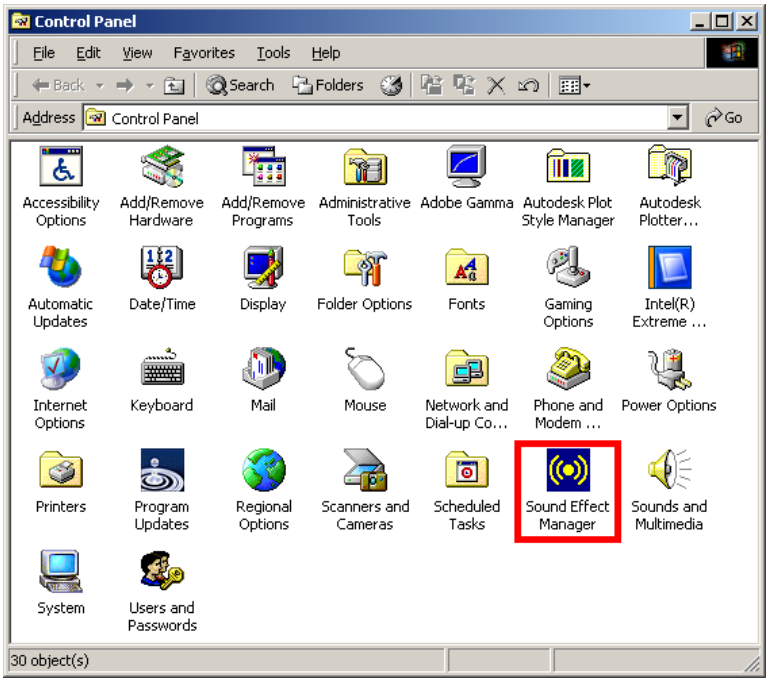

Figure G-1: Control Panel Sound Effect Manager

G.2 Sound Effect Configuration

G.2.1 Accessing the Sound Effects Manager

Follow the steps below to access the **Sound Effect Manager**.

Step 1: Install the ALC655 audio CODEC driver (see Section Error! Reference source not found.).

Step 2: Click the Sound Effect Manager icon in the system task bar (**Figure G-2**).

Figure G-2: Sound Effect Manager Icon [Task Bar]

Step 3: The sound effect manager appears (**Figure G-3**).

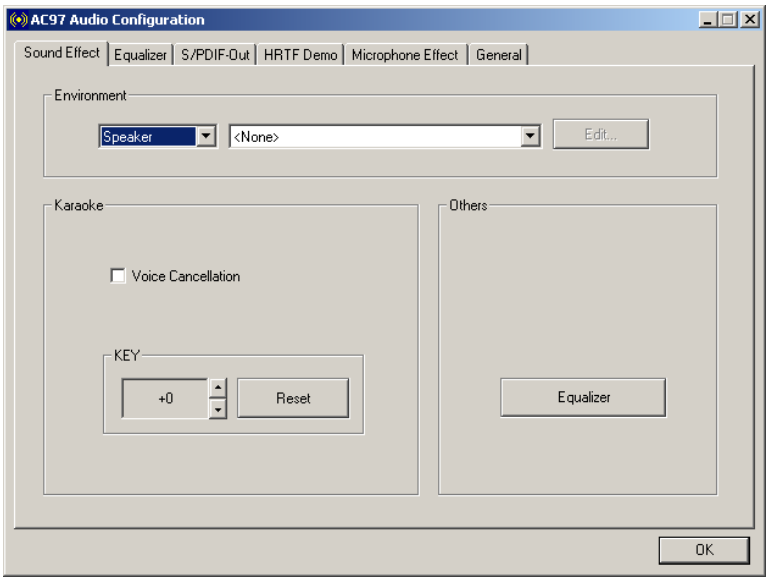

Figure G-3: Sound Effects Manager (ALC655)

NOTE:

The Sound Effect Manager shown in **Figure G-3** is for the Realtek ALC655 audio Codec. Different Codecs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

G.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure G-3)**.

NOTE:

The Karaoke Mode is configured in the Sound Effect menu. To access Karaoke configuration settings, click on the Sound Effect menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all Realtek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect*** - Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. Click **EDIT** to edit the sound effect.
- ***Karaoke Mode*** - **Karaoke Mode** is accessed in the Sound Effect tab. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enable users to define a key that fits a certain vocal range.
- ***Equalizer Selection*** - Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration*** - Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phone jack switch with speakers settings
- ***Speaker Test*** - Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out*** - S/PDIF is used to transmit digital and analog audio signals with either a 48 or 44.1kHz sample rate.
- ***HRTF Demo*** - Adjust HRTF (Head Related Transfer Functions) 3D positional audio before running 3D applications.
- ***Microphone Effect*** - Microphone noise suppression is enabled in this menu.
- ***General*** - General information about the installed AC'97 audio configuration utility is listed here.

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